5-4310-378-14

TM 5-4310-378-14

INTRODUCTION 1-1

OPERATING INSTRUCTIONS 2-1

UNIT MAINTENANCE INSTRUCTIONS 3-1

INTERMEDIATE DIRECT SUPPORT MAINTENANCE INSTRUCTIONS 4-1

INTERMEDIATE GENERAL SUPPORT MAINTENANCE INSTRUCTIONS 5-1

REFERENCES A-1

MAINTENANCE ALLOCATION CHART B-1

COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LIST C-1

ADDITIONAL AUTHORIZATION LIST D-1

EXPENDABLE SUPPLIES AND MATERIALS LIST E-1

GLOSSARY

TECHNICAL MANUAL

OPERATOR'S, UNIT, INTERMEDIATE DIRECT SUPPORT, AND INTERMEDIATE GENERAL SUPPORT MAINTENANCE MANUAL FOR

COMPRESSOR UNIT, RECIPROCATING, 5 CFM 175 PSI, GASOLINE ENGINE DRIVEN, HAND TRUCK MOUNTED MODEL NUMBER ZPC175/5 NSN 4310-01-190-0285

This copy is a reprint which includes current pages from Change 1.

HEADQUARTERS, DEPARTMENT OF THE ARMY

1 JULY 1986

D101.11:

READEX FICHE best copy available

CHANGE No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 6 September 1988

Operator's, Unit, Intermediate Direct Support, and Intermediate General Support Maintenance Manual for

COMPRESSOR UNIT, RECIPROCATING, 5 CFM 175 PSI, GASOLINE ENGINE DRIVEN, HAND TRUCK MOUNTED
MODEL NUMBER ZPC175/5
NSN 4310-01-190-0285

TM 5-4310-378-14, 1 July 1986, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
i and ii	i and ii
2-3 through 2-13/2-14	2-3 through 2-16
3-7 and 3-8	3-7 and 3-8
3-9 and 3-10	3-9
3-11 through 3-14	3-14
A-1/A-2	A-1/A-2
B-3 through B-8	B-3 through B-8
Index-1 through Index-3/Index-4	Index-1 through Index-3/Index-4

2. Retain this sheet in front of manual for reference purposes.

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-25A, Operator, Unit, Direct Support and General Support Maintenance requirements for Compressor Unit, Reciprocal, Model ZPC 175/5 (TM 5-4310-378 Series).

WARNING PAGE

WARNING

CARBON MONOXIDE

is produced by the internal combustion engine of this compressor.

DEATH

may result if personnel fail to observe safety precautions.

Carbon monoxide is a colorless, odorless, deadly poisonous gas which, when breathed, deprives the body of oxygen and causes suffocation. Exposure to air contaminated with carbon monoxide produces symptoms of headache, dizziness, loss of muscle control, or apparent drowsiness. Coma, permanent brain damage, or death can result from severe exposure.

Carbon monoxide occurs in the exhaust fumes of internal combustion engines and becomes dangerously concentrated under conditions of inadequate ventilation. Observe the following safety precautions whenever the engine is running.

- Perform tests outdoors or in a well-ventilated area.
- Do not idle the engine for long periods without maintaining adequate ventilation.
- Be alert at all times for exhaust odors and exposure symptoms.
- Be aware: the field protective mask for chemical-biological-radiological (CBR) protection will not protect you from carbon monoxide poisoning.

Expose victims to fresh air, keep warm, and do not permit physical exercise. For artificial respiration, refer to FM21-11.

SEVERE BURNS

Illness, death, or injury may result if personnel fail to handle gasoline properly. Observe the following safety precautions:

- Do not inhale vapor.
- Do not refuel a hot or running engine.
- Do not refuel near open flame, sparks, or excessive heat.
- Be certain fuel lines and connections are secure.
- Do not overfill the fuel tank.
- Work in a well-ventilated area.

Allow an engine and pump to cool before performing any service or maintenance.

WARNING

PERSONAL INJURY

may result if the engine cutoff switch is not pushed in during service or maintenance.

ELECTRICAL SHOCK

may result from performing maintenance while the engine is running. The ignition system of this engine contains dangerous voltages which can cause severe electrical shock.

HEALTH AND SAFETY HAZARD

Dry Cleaning Solvent
(Stoddard Solvent)
P-D-680

- Combustible - do not use near open flames, near welding areas, or on hot surfaces.
- Prolonged or repeated contact of skin with liquid can cause dermatitis. Repeated inhalation of vapor can irritate nose and throat and can cause dizziness.
- If any liquid contacts skin or eyes, immediately flush affected area thoroughly with water. Remove solvent-saturated clothing. If vapors cause dizziness, go to fresh a
- When handling liquid or when applying it in an air-exhausted, partially covered tank, wear approved gloves.
- When handling liquid or when applying it at an unexhausted, uncovered tank or workbench, wear approved respirator, goggles, and gloves.

EYE INJURY

Compressed Air

- When using compressed air for any cleaning or drying operation, do not exceed 30 psig at the nozzle.
- Eyes can be permanently damaged by contact with liquid or large particles propelled by compressed air. Inhalation of air-blown particles or solvent vapor can damage lungs.
- When using air for drying or cleaning at an air-exhausted workbench, wear approved goggles or face shield.
- When using air for drying or cleaning at an unexhausted workbench, wear approved respirator and goggles.

TECHNICAL MANUAL

NO. 5-4310-378-14

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 1 July 1986

Operator's, Unit, Intermediate Direct Support, and Intermediate General Support Maintenance Manual

for

COMPRESSOR UNIT, RECIPROCATING, 5 CFM 175 PSI, GASOLINE ENGINE DRIVEN, HAND TRUCK MOUNTED

MODEL NUMBER ZPC175/5
NSN 4310-01-190-0285

Reporting Errors and Recommending Improvements

You can help improve this manual. If you find any mistake or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual, directly to: Commander, U.S. Army Troop Support Command, ATTN: AMSTR-MCTS, 4300 Goodfellow Blvd., St.Louis, MO 63120-1798. A reply will be furnished to you.

TABLE OF CONTENTS

		Page
CHAPTER 1.	INTRODUCTION	1-1
Section I.	General Information	1-1
Section II.	Equipment Description	1-3
Section III.	Technical Principles of Operation	1-7
CHAPTER 2.	OPERATING INSTRUCTIONS	2-1
Section I.	Description and Use of Operator's Controls and Indicators	2-1
Section II.	Operator Preventive Maintenance Checks and Services (PMCS)	2-4
Section III.	Operation Under Usual Conditions	2-8
Section IV.	Operation Under Unusual Conditions	2-13

TABLE OF CONTENTS (Continued)

Page

CHAPTER 3. UNIT MAINTENANCE INSTRUCTIONS 3-1

Section I. Lubrication Instructions 3-1
Section II. Repair Parts, Special Tools, TMDE, and Support Equipment 3-5
Section III. Service (Unusual) Upon Receipt of Equipment 3-5
Section IV. Unit Preventive Maintenance Checks and Services (PMCS) 3-5
Section V. Troubleshooting 3-14
Section VI. Maintenance Procedures 3-16
Section VII. Preparation for Storage or Shipment 3-68

CHAPTER 4. INTERMEDIATE DIRECT SUPPORT MAINTENANCE INSTRUCTIONS 4-1

Section I. Troubleshooting 4-1
Section II. Maintenance Procedures 4-6

CHAPTER 5. INTERMEDIATE GENERAL SUPPORT MAINTENANCE INSTRUCTIONS 5-1

Section I. Troubleshooting ....
Section II. Maintenance Procedures 5-2

APPENDIX A. REFERENCES A-1

APPENDIX B. MAINTENANCE ALLOCATION CHART (MAC) B-1

APPENDIX C. COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LIST C-1

APPENDIX D. ADDITIONAL AUTHORIZED LIST D-1

APPENDIX E. EXPENDABLE SUPPLIES & MATERIALS LIST E-1

GLOSSARY GLOSSARY-1

ALPHABETICAL INDEX INDEX-1

CHAPTER 1

INTRODUCTION

Section I. GENERAL INFORMATION

1-1. SCOPE

Type of Manual: Operator's, Unit, Intermediate Direct Support, and Intermediate General Support Maintenance

Model Number and Equipment Name: ZPC175/5 Reciprocating Compressor Unit, 5 cfm, 175 psi Gasoline Engine Driven.

Purpose of Equipment: Compresses Air

1-2. MAINTENANCE FORMS, RECORDS, AND REPORTS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-750, The Army Maintenance Management System (TAMMS).

1-3. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

Refer to TM 750-244-3, Procedures for Destruction of Equipment to Prevent Enemy Use.

1-4. PREPARATION FOR STORAGE AND SHIPMENT

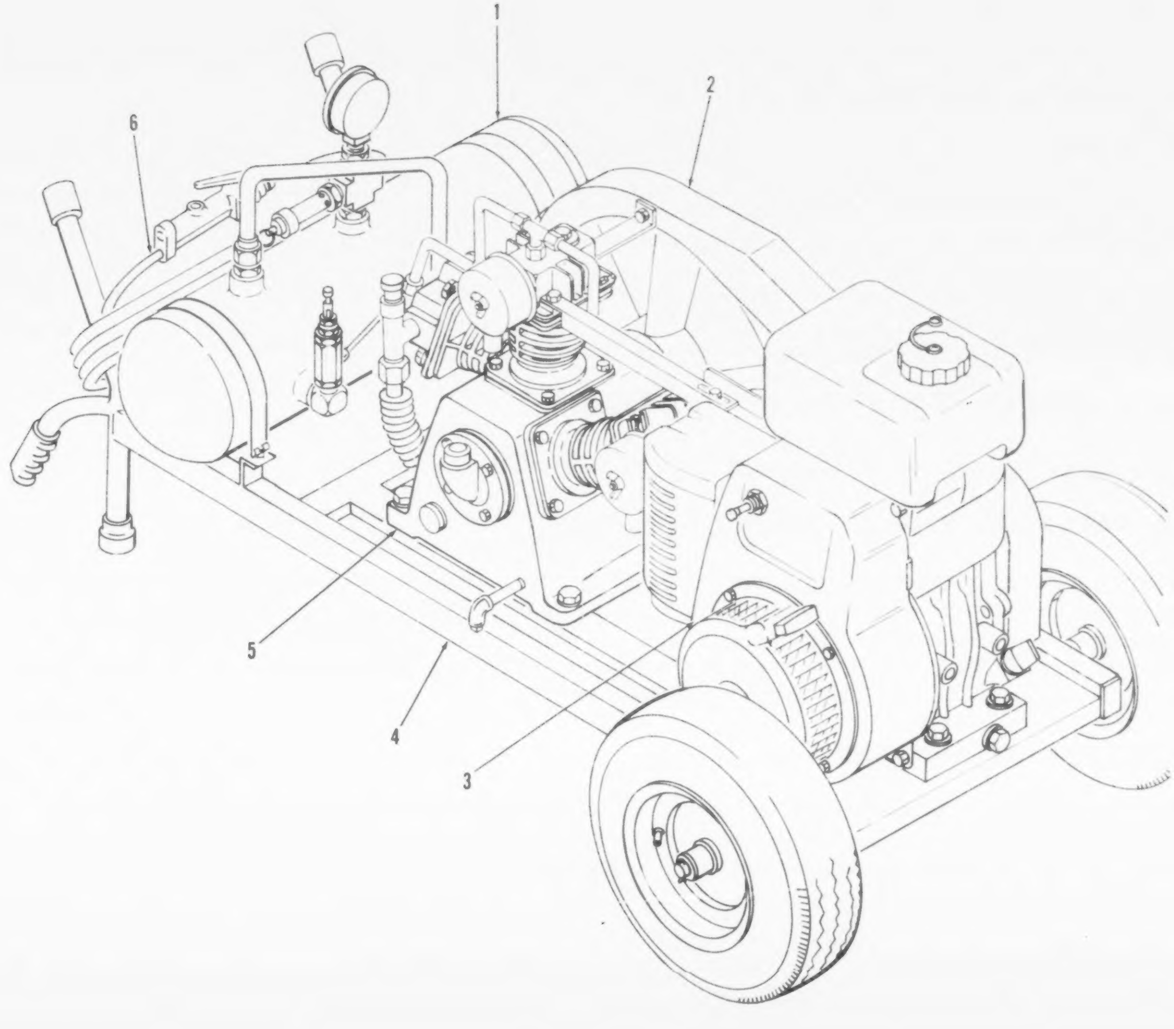
Instructions for preparation for storage and shipment are in Chapter 3.

1-5. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your air compressor needs improvements, let us know. Send us an EIR. You, the user are the only one who can tell us what you don't like about your equipment. Let us know what you don't like about the design or performance. Put it on an SF 368 (Quality Deficiency Report). Mail it to Commander, US Army Troop Support Command, ATTN: AMSTR-QX,4300 Goodfellow Blvd., St. Louis, MO 63120-1798. We'll send you a reply.

1-6. WARRANTY INFORMATION

All components of the ZPC175/5 Reciprocating Compressor are warranted by Zwick Energy Research Organization for a period of 1 year. The warranty starts on the date of shipment as shown on the Material Inspection and Receiving Report (DD form 250), and Equipment Identification Plate.



Section II. EQUIPMENT DESCRIPTION

1-7. PURPOSE OF AIR COMPRESSOR UNIT

Compresses air for inflating tires

1-8. CAPABILITIES AND FEATURES

- Handtruck mounted for portability
- Variable control of operating rate
- Engine cutoff switch for positive control
- Air cooled

1-9. LOCATION AND DESCRIPTION OF EXTERNAL COMPONENTS

1 AIR TANK. Steel tank that accumulates compressed air.

2 BELT GUARD. Protects operator, pulley, and flywheel.

3 ENGINE. Single cylinder, four-stroke, air cooled gasoline engine.

4 HANDTRUCK. Welded steel frame with pneumatic tires.

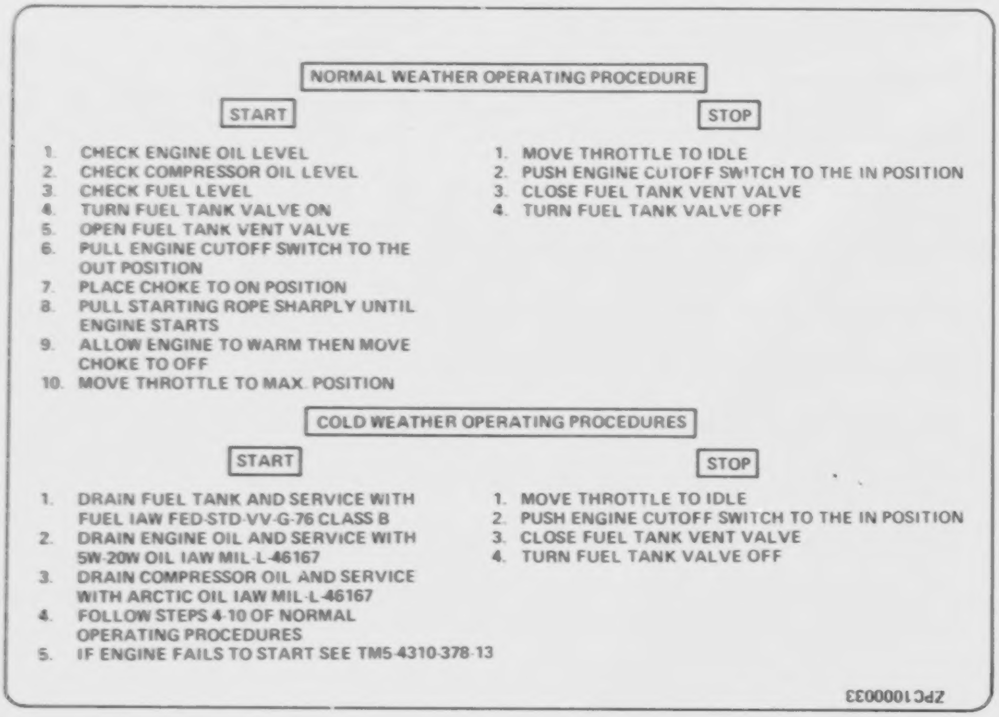
5 COMPRESSOR. Two-stage, three-cylinder design.

6 AIR HOSE AND INFLATOR GAGE. Fifty-foot rubber hose. Inflator gage equipped with regular and jumbo size air chucks.

1-10. IDENTIFICATION

The compressor has two identification plates, as follows:

A. Operating Procedure Plate. The operating procedure plate is located on the fuel tank.



NORMAL WEATHER OPERATING PROCEDURE

START

1. CHECK ENGINE OIL LEVEL
2. CHECK COMPRESSOR OIL LEVEL
3. CHECK FUEL LEVEL
4. TURN FUEL TANK VALVE ON
5. OPEN FUEL TANK VENT VALVE
6. PULL ENGINE CUTOFF SWITCH TO THE OUT POSITION
7. PLACE CHOKE TO ON POSITION
8. PULL STARTING ROPE SHARPLY UNTIL ENGINE STARTS
9. ALLOW ENGINE TO WARM THEN MOVE CHOKE TO OFF
10. MOVE THROTTLE TO MAX. POSITION

STOP

1. MOVE THROTTLE TO IDLE
2. PUSH ENGINE CUTOFF SWITCH TO THE IN POSITION
3. CLOSE FUEL TANK VENT VALVE
4. TURN FUEL TANK VALVE OFF

COLD WEATHER OPERATING PROCEDURES

START

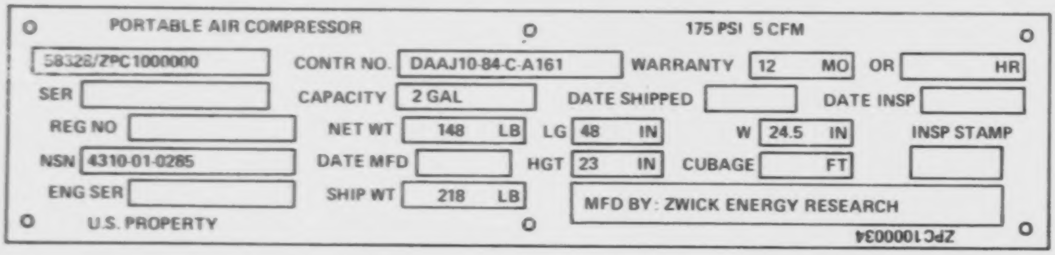
1. DRAIN FUEL TANK AND SERVICE WITH FUEL IAW FED-STD-VV-G-76 CLASS B
2. DRAIN ENGINE OIL AND SERVICE WITH 5W-20W OIL IAW MIL-L-46167
3. DRAIN COMPRESSOR OIL AND SERVICE WITH ARCTIC OIL IAW MIL-L-46167
4. FOLLOW STEPS 4-10 OF NORMAL OPERATING PROCEDURES
5. IF ENGINE FAILS TO START SEE TM5-4310-378-13

STOP

1. MOVE THROTTLE TO IDLE
2. PUSH ENGINE CUTOFF SWITCH TO THE IN POSITION
3. CLOSE FUEL TANK VENT VALVE
4. TURN FUEL TANK VALVE OFF

ZPC1000033

B. Identification Plate. The identification plate is located on the left frame rail nea the handle. It provides the compressor nomenclature, national stock number, compressor an engine serial numbers, contract number, weight, and dimension.



PORTABLE AIR COMPRESSOR

175 PSI 5 CFM

58326/ZPC1000000

CONTR NO. DAAJ10-84-C-A161

WARRANTY 12 MO OR HR

SER

CAPACITY 2 GAL

DATE SHIPPED

DATE INSP

REG NO

NET WT 148 LB

LG 48 IN

W 24.5 IN

INSP STAMP

NSN 4310-01-0285

DATE MFD

HGT 23 IN

CUBAGE FT

ENG SER

SHIP WT 218 LB

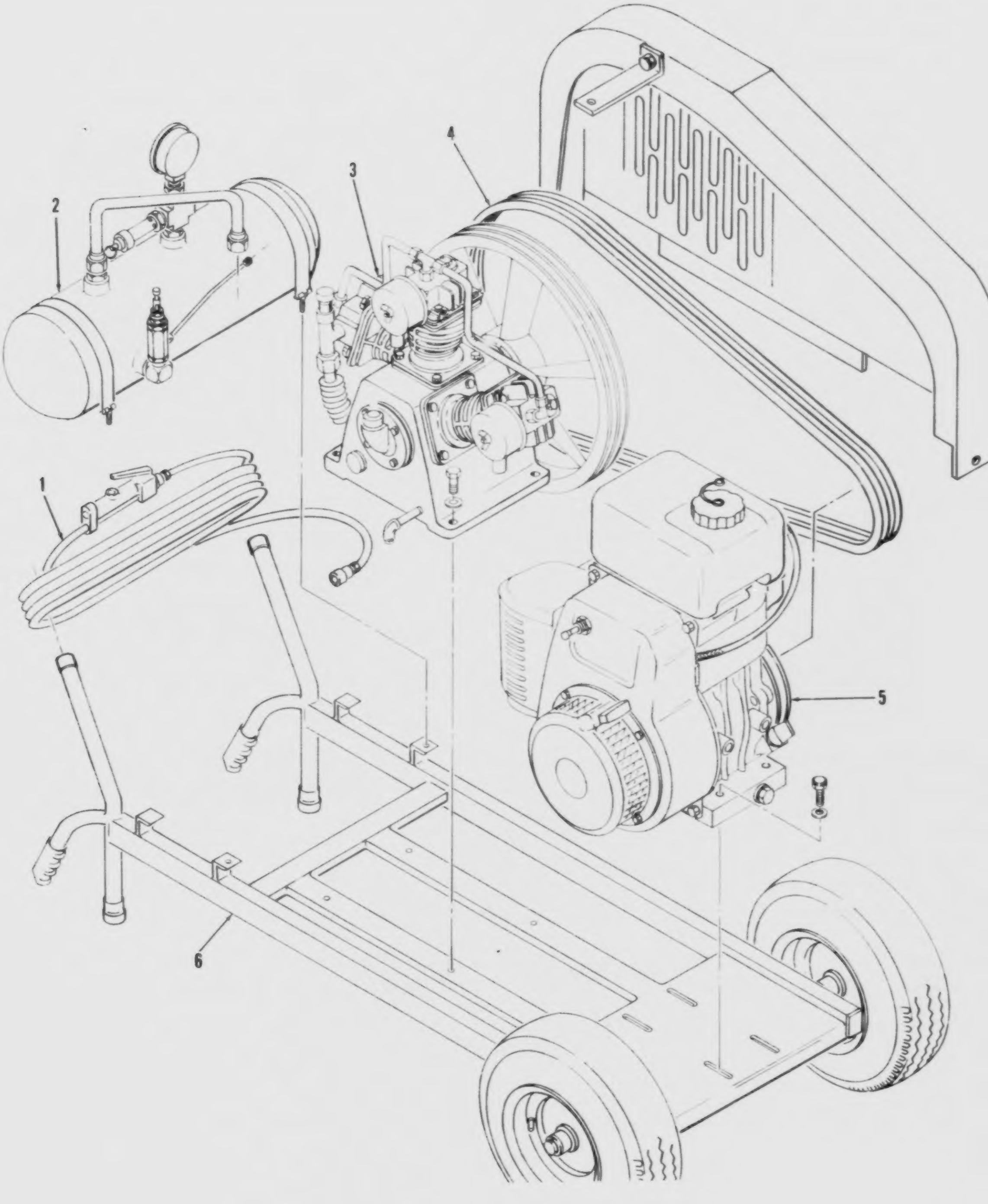
MFD BY: ZWICK ENERGY RESEARCH

U.S. PROPERTY

ZPC1000034

1-11. EQUIPMENT DATA

A. Air Compressor Unit	
Manufacturer	Zwick Energy Research Huntington Beach, CA
Model Number	ZPC175/5
Type	Two stage
Output (Maximum rated speed)	5 cfm at 175 psig (0.14 m^3/minute 12.3 kg/cm^2)
Rated speed	
Engine	3600 rpm
Compressor	60 strokes per minute
Length	48 inches (1219 mm)
Width	24 inches (610 mm)
Height	26 inches (660 mm)
Weight, net	148 pounds (67 kg)
Weight, shipping	218 pounds (99 kg)
Capacities	
Engine crankcase	1-1/4 pints (0.6 litre)
Compressor crankcase	1-3/4 pints (0.8 litre)
Fuel tank	
Air receiver tank	2 gallons (7.6 litre)
B. Engine	
Manufacturer	Teledyne Wisconsin Motor, Milwaukee, WI
Model number	W1-185
Type	Four cycle
Horsepower	4.6 (3.4 kW)
Cooling type	Air
Lubricating oil	Per MIL-L-2104
Air cleaner	Oiled, wet
C. Compressor	
Manufacturer	Curtis-Toledo, St. Louis MO.
Model number	E23A
Type	Three-cylinder, two-stage
Cooling	Air
Lubricating oil	Per MIL-L-2104
Air cleaner	Dry
D. Spark plug	MS35909-4
Gap	0.024 to 0.027 in. (0.6 to 0.7 mm)



Section III. TECHNICAL PRINCIPLES OF OPERATION

1-12. SECTION OVERVIEW

This section consists of a description of how the air compressor works. Paragraph 1-13 describes the operation of the whole system. Paragraph 1-14 describes the operation of the compressor.

1-13. AIR COMPRESSOR UNIT FUNCTION

1 AIR DISCHARGE SYSTEM. Controls the discharge of air from the air receiver. A 50-foot air hose, equipped with an inflator gage, is used to inflate tires and to read tire pressure.

2 AIR RECEIVER. Stores air compressed by the air compressor. It is equipped with a gage to measure air pressure.

3 AIR COMPRESSOR. Compresses air in two stages to put out 5 cfm at 175 psig (0.14 m^3/minute at 12.3 kg/cm^3).

4 COMPRESSOR DRIVE. Transmits power from the engine to the air compressor by means of a pair of matched V-belts. A belt guard protects the operator from injury and the engine pulley and compressor flywheel from damage.

5 GASOLINE ENGINE. Provides 4.6 horsepower (3.4 kW) to run the compressor.

6 HANDTRUCK ASSEMBLY. Gives the air compressor mobility. It is equipped with two pneumatic rubber tires to provide a soft ride.

1-14. AIR COMPRESSOR. The picture below shows the general operation of the air compresso The air compressor has two low pressure cylinders which both feed into the high pressure cylinder. Only one low pressure cylinder is shown here.

The compression cycle starts with the low pressure pistons (1) at the top of stroke.

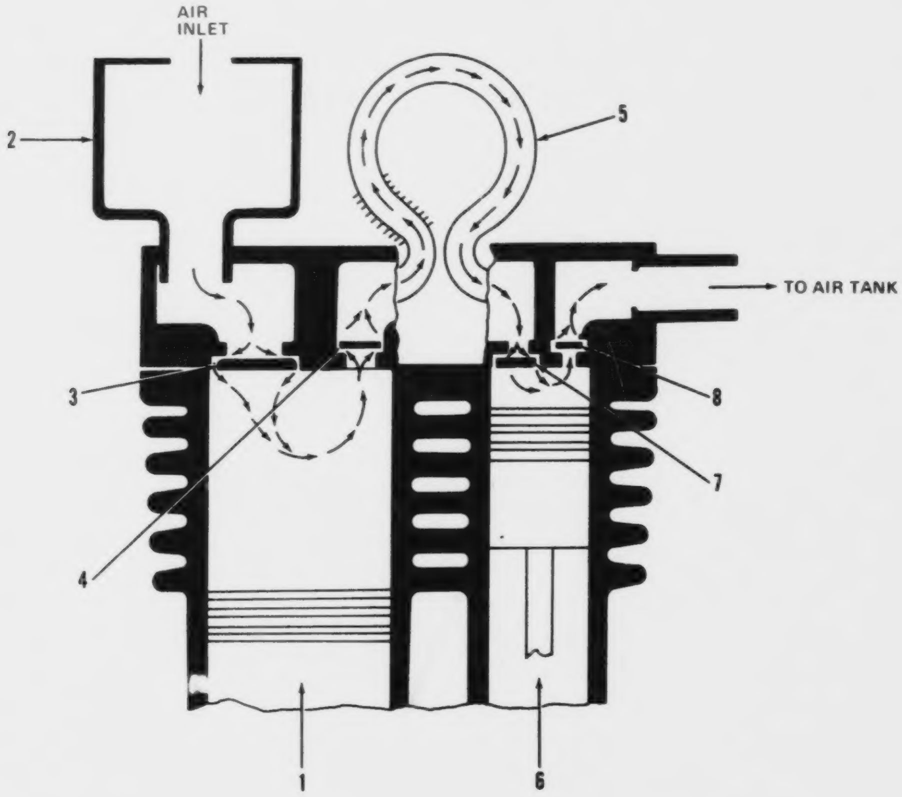
When the pistons move down, they draw air through the air filters (2) and inlet valve (3) into the cylinders. The air filters keep dirt out of the compressor.

On the upstroke, inlet valve (3) closes and the pistons (1) push air out into the intercooler (5) through the exhaust valve (4).

Compressing the air heats it up. The intercooler (5) gets rid of some of that heat before passin the air on to the high pressure stage.

The high pressure stage works the same as the low pressure stage except that the high pressure piston goes up when the low pressure pistons go down. This way, the low pressure pistons are drawing air in while the high pressure is pushing air out.

Compressed air from the high pressure stage goes to the air tank through a connecting tube.



CHAPTER 2

OPERATING INSTRUCTIONS

Section I. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS

2-1. GENERAL.

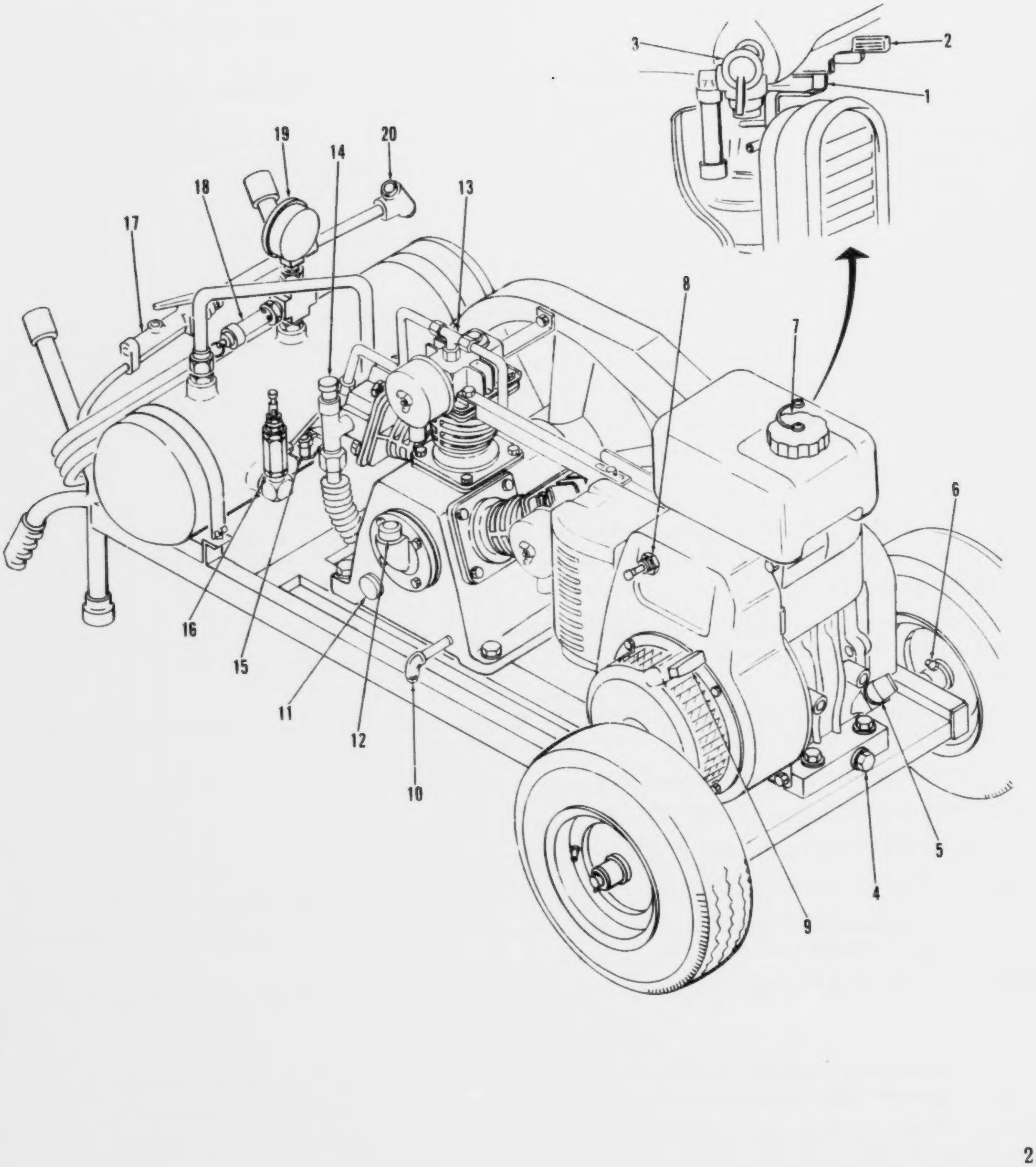
Table 2-1 will show you the controls and indicators you will need to operate the air compressor unit.

Table 2-1. Compressor Assembly Controls and Indicator

KEY	CONTROL OR INDICATOR	FUNCTION
1	Choke lever	Aids in starting a cold engine by enriching the fuel mixture.
2	Speed control lever	Controls engine speed. Rotating lever fully counterclockwise is high speed and fully clockwise is low speed.
3	Fuel cock	Controls fuel flow. Vertical position is fuel ON and horizontal position is fuel OFF.
4	Engine drain plug	Allows engine crankcase to be drained for periodic oil changes.
5	Dipstick	Measures oil in engine crankcase. Safe engine operating level is indicated between upper and lower level marks on dipstick.
6	Grease fitting	Grease fitting for wheel. One is installed on the inside of each wheel.
7	Fuel filler	Provides opening for filling gas tank. A strainer inside the opening ensures clean fuel. The fuel tank is translucent so the fuel level is visible. A fuel tank vent is located in the filler cap to allow fuel tank pressure to equalize. When the vent is rotated fully clockwise, it is closed.
8	Ignition switch	Labeled TO STOP PUSH IN, this switch must be pulled out to start the engine. When any maintenance is being performed on the compressor assembly, this switch must be pushed in to prevent the equipment from starting up.
9	Recoil starter	Starts engine when rope is pulled.
10	Compressor drain plug	Allows compressor crankcase to be drained for periodic oil changes.

Table 2-1. Compressor Assembly Controls and Indicator (Continued)

KEY	CONTROL OR INDICATOR	FUNCTION
11	Oil level sight gage	Indicates level of oil in compressor crankcase.
12	Oil filler/breather cap	Keeps dirt out of the oil filler and relieves pressure buildup in compressor crankcase.
13	Unloader valves	Located in each cylinder head on the compressor, these valves vent excess pressure to the atmosphere.
14	Interstage relief valve	Relieves excess interstage pressure.
15	Air tank drain valve	Drains moisture from air tank. Manually operated.
16	Pilot valve	Senses tank pressure and at 180 psi signals compressor cylinder unloader valves to vent compressor to atmosphere.
17	Inflator gage	Indicates air pressure in system being pressurized.
18	Air tank relief valve	Releases compressed air in excess of compressor safet limits. A pull ring is provided to check operation.
19	Pressure gage	Indicates air pressure available for use.
20	Dual foot air chucks	Used to inflate tires. Two different sizes provided to accommodate different sized tire valves.



SECTION II. OPERATOR'S PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

2-2. GENERAL. The operators PMCS table lists the inspections and service procedures to properly mainta the air compressor in good operating condition. Items covered here are appropriate for operator level only. Alwa keep in mind the CAUTIONS and WARNINGS before performing checks and services listed in the PMCS tab

2-3. PMCS TABLE FORMAT. The following columns make up the PMCS table.

a. *Item No.* Each maintenance check is identified by a separate item number. The item column will be us as a source of item numbers for the "TM Number" column on DA Form 2404 Equipment Inspection a Maintenance Worksheet, in recording results of PMCS.

b. *Interval.* The interval column of the PMCS table identifies when to perform the service check or maintenan A dot (•) appears underneath the appropriate column(s) abbreviation:

B —Before Operation
D —During Operation
A —After Operation
W—Weekly
M—Monthly
Q —Quarterly

c. *Item To Be Inspected/Procedure.* This column identifies how to perform the required checks and servic Carefully follow these instructions. If appropriate tools are not available to operator, organizational maintenan should perform the work. If your equipment does not perform as required, refer to Chapter 3, Section Troubleshooting for possible problems. Report any malfunctions or failures to organizational maintenanc

d. *Equipment Not Ready/Available If:* This column indicates when and why equipment cannot be used aft completing the specific PMCS.

NOTE

The terms *ready/available* and *mission capable* refer to the same status: Equipment is on hand and is able to perform its combat missions (see DA PAM 738-750).

2-4. SPECIAL INSTRUCTIONS.

a. If the equipment must be kept in continuous operation, check and service only those items that can be chec ed and serviced without disturbing operation. Make the complete checks and services when the equipment c be shut down.

b. "Before Operation (B)" checks should be limited to those required for consecutive application by an assign operator. Perform "Weekly (W)" as well as "Before Operation (B)" PMCS if:

(1) Compressor has not been operated since the last weekly PMCS, or;

(2) Compressor is being operated for the first time.

c. Leakage definitions for operator PMCS are classified as follows:

Class I	Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.
Class II	Leakage of fluid great enough to form drops but not enough to cause drops to drip from item bei checked/inspected.
Class III	Leakage of fluid great enough to form drops that fall from the item being checked/inspected.

CAUTION

Equipment operation is allowable with minor leakages (Class I or II). Consider the fluid capacity in the item system being checked/inspected. When in doubt, notify your supervisor.

When operating with Class I or Class II leaks, continue to check fluid levels as required by PMCS table.

Class III leaks should be reported to your supervisor.

Table 2-2. Operator Preventive Maintenance Checks and Services

B—Before D—During A—After W—Weekly M—Monthly Q—Quarterly

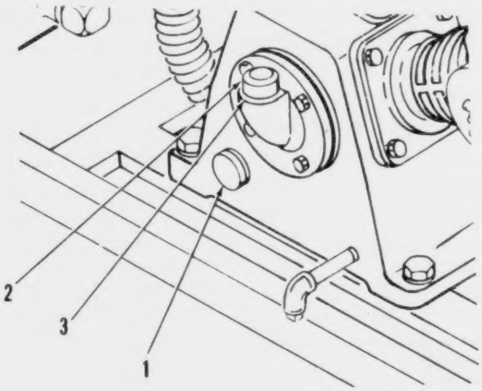
ITEM No.	INTERVAL						ITEM TO BE INSPECTED PROCEDURE:	EQUIPMENT IS NOT READY/AVAILABLE IF:
	B	D	A	W	M	Q		
1	•			•			**Engine Recoil Starter**. Inspect for completeness and secure mounting. Inspect for signs of wear.	Any signs of damage.
2	•						**Belt Guard Assembly**. Inspect for damage and secure mounting.	Any signs of damage, loose mounting, or missing hardware.
3	•	•					**Engine**. Inspect for secure mounting. Inspect for overheating.	Loose mounting or overheating.
4	•		•				**Fuel Tank and Fuel Filter**. Inspect for fuel level and sediment in fuel filter bowl.	
5		•			•		**Cooling System Ducts, Covers, and Deflectors.** Inspect for secure mounting. Inspect for overheating.	Overheating.
6	•	•	•		•		**Flexible Hoses and Rigid Tubing**. Inspect for damage, loose connections, and air leakage.	Cracked and/or leaking.
7	•						**Compressor Oil Sight Glass.** Be sure that oil level is in center of sight gage (1). If oil is low, remove oil breather cap (2) and add oil (Appendix E, Item 5) to breather cap opening (3) until oil level is at center of sight gage (1). 	Oil level is low.

Table 2-2. Operator Preventive Maintenance Checks and Services (Continued)

B—Before D—During A—After W—Weekly M—Monthly Q—Quarterly

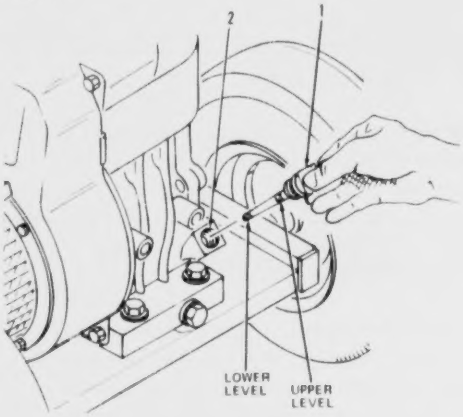
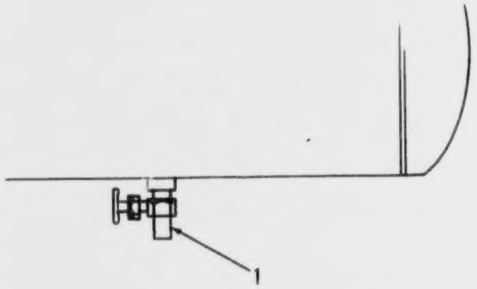
ITEM No.	INTERVAL						ITEM TO BE INSPECTED PROCEDURE:	EQUIPMENT IS NOT READY/AVAILABLE IF:
	B	D	A	W	M	Q		
8	•		•				**Engine Oil Dipstick.** Check that oil level is between LOWER LEVEL and UPPER LEVEL on dipstick. Unscrew dipstick (1) from engine crankcase. Wipe off dipstick with clean rag and insert all the way into the crankcase. Do not thread in place to check oil level. If oil is low, add oil (Appendix E, item 5) through dipstick opening (2). Screw dipstick in finger tight. 	Oil level is low, or dipstick is missing.
9	•	•	•				**Drain Valve.** Open the drain cock (1) and allow all condensed moisture to drain off. Close the drain valve. 	Leaking or missing.

Table 2-2. Operator Preventive Maintenance Checks and Services (Continued)

B—Before D—During A—After W—Weekly M—Monthly Q—Quarterly

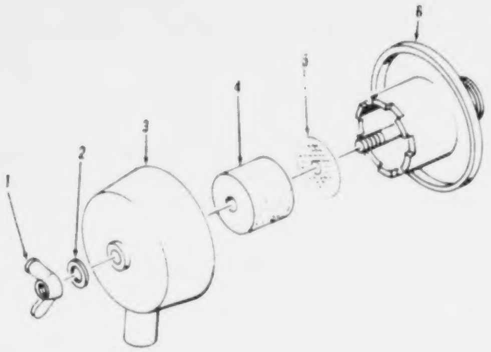
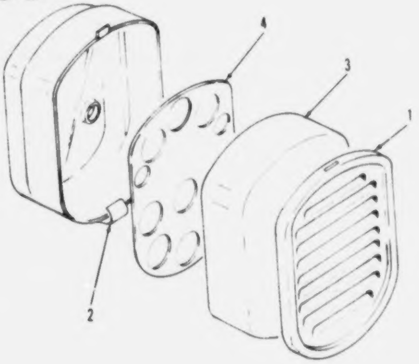
ITEM No.	INTERVAL						ITEM TO BE INSPECTED PROCEDURE:	EQUIPMENT IS NOT READY/AVAILABLE IF:
	B	D	A	W	M	Q		
10				•			**Compressor Air Cleaners.** Clean the air cleaners as follows: Remove wing nut (1), washer (2), and cover (3). Remove filter (4) and screen (5). Clean filter (4) and screen (5) in a solution of mild soap and water. Rinse thoroughly and allow to dry. Wipe the cover (3) and body (6) clean with a clean cloth. Install screen (5), filter (4), cover (3), washer (2), and wing nut (1).  	
11				•			**Engine Air Cleaner.** Take off cover (1) by pulling down and outward at clip (2). Remove element (3) and retainer (4). Wipe all metal parts clean and wash element in a solution of mild soap and water. Wrap element in clean toweling and squeeze dry. Soak element in kerosene (Appendix E, item 8), then squeeze out excess kerosene. Install retainer (4) and element (3) then cover (1). Make certain clip (2) is engaged.  	

Table 2-2. Operator Preventive Maintenance Checks and Services (Continued)

B—Before D—During A—After W—Weekly M—Monthly Q—Quarterly

ITEM No.	INTERVAL						ITEM TO BE INSPECTED PROCEDURE:	EQUIPMENT IS NOT READY/AVAILABLE IF
	B	D	A	W	M	Q		
12				•			**Air Compressor Assembly**. Clean the complete air compressor (external) with a solution of mild soap and water. Rinse thoroughly and allow to dry.	
13				•			**Air Tank Relief Valve**. Pull the ring on the pressure relief valve with the compressor running. The valve should allow air to escape.	Pressure valve does not allow air to escape.

Section III. OPERATION UNDER USUAL CONDITIONS

2-5. ASSEMBLY AND PREPARATION FOR USE

a. This compressor comes fully assembled and is ready for use after draining preservation oil in the eng checking oil in the compressor, and filling the fuel tank. Refill engine crankcase and add to compressor crankc oil (Appendix E, item 5), as necessary.

b. Instructions for use are for information and guidance of personnel responsible for operation of the c pressor assembly.

c. The operator must know how to perform every operation of which the compressor assembly is capa The following paragraphs contain instructions on starting and stopping the compressor assembly, on operat of the compressor assembly, and on coordinating the basic motions to perform the specific tasks for which equipment is designed.

2-6. INITIAL ADJUSTMENTS

Inspect compressor assembly and engine for loose or missing hardware, corrosion, or obvious damage. Re any problems to your supervisor.

2-7. OPERATING PROCEDURE

a. Selection and Preparation of Compressor Site.

(1) Locate the compressor on a level surface as close to the tires to be inflated as possible.

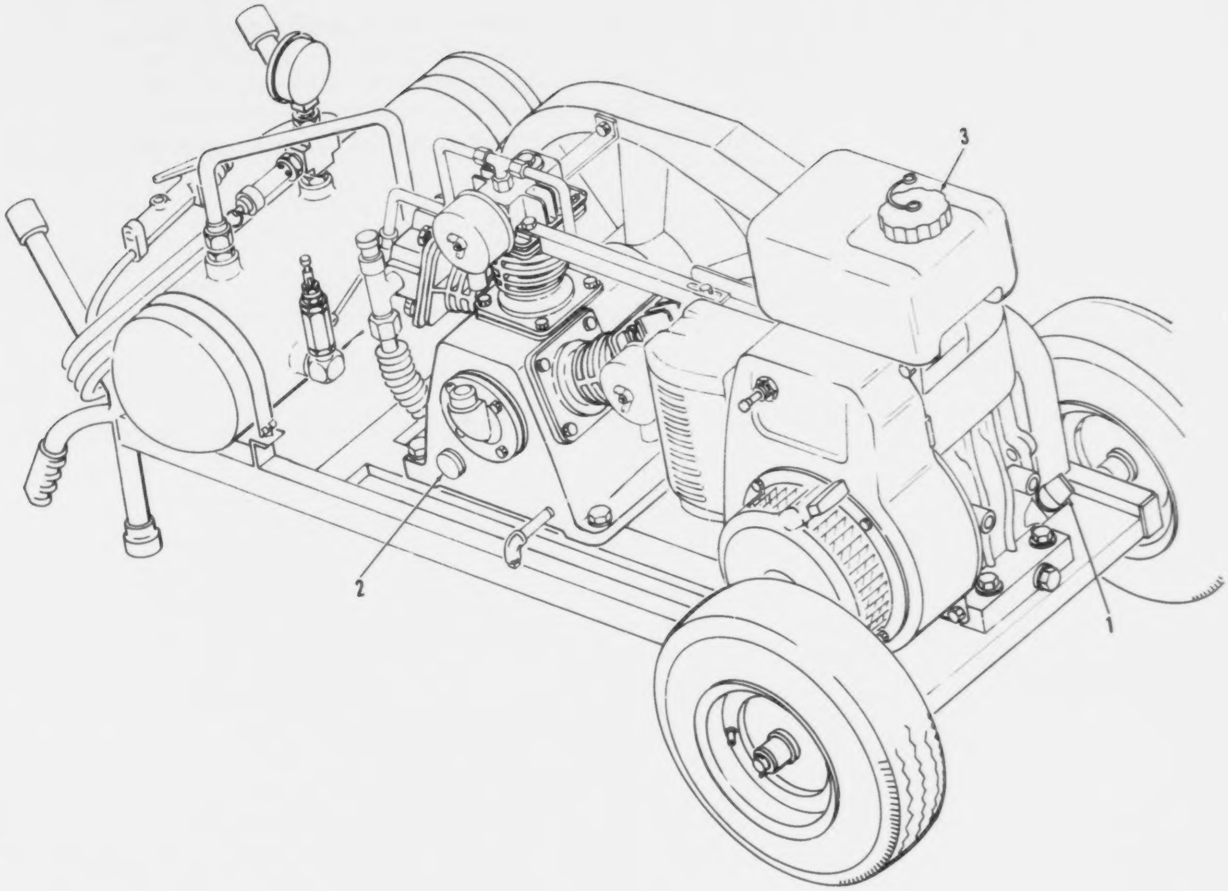
2-8. STARTING

a. Check oil level in:

(1) The engine. Engine oil dipstick (1).

(2) The compressor. Compressor oil level sight glass (2).

Fill as required.



2-8 STARTING (cont.)

WARNING

Severe burns, illness, or death may result if personnel fail to handle gasoline properly. Observe the following precautions:

- Do not inhale vapor.
- Do not refuel a hot or running engine.
- Do not refuel near open flame, sparks, or excessive heat.
- Be certain fuel lines and connections are secure.
- Do not overfill fuel tank.
- Work in a well-ventilated area.

WARNING

- **Serious hearing loss or deafness could occur if this equipment is operated without professionally-fitted ear protection for operating and maintaining personnel. The noise level for this equipment exceeds the allowable limits for unprotected personnel. Unprotected/unnecessary personnel must be kept out of the immediate area.**

WARNING

- **Do not use this compressor for charging cylinders that require breathable air.**

b. Fill fuel tank. Fuel tank filler (3).

c. Open the drain valve and allow all pressure to drain from air receiver tank. Close drain

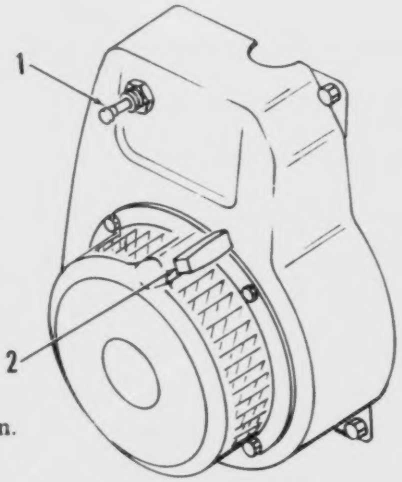
2-8. STARTING (cont.)

d. Turn fuel cock ON (turn to vertical position).

CAUTION

Do not open fuel tank vent more than two turns to avoid loss of screw.

e. Open fuel tank vent in fuel tank cap (rotate two turns counterclockwise).



f. Prime fuel system if engine is new or seldom used.

   (1) Push ignition switch (1) IN.

   (2) Close choke.

   (3) Pull starting rope (2).

   (4) Allow starting rope to retract.

   (5) Pull starting rope again.

   (6) Allow to retract.

g. Pull ignition switch out. Set speed control at mid position.

h. Pull starting rope sharply.

i. Allow to retract.

j. When engine starts, gradually open choke and move speed control to max position.

k. Repeat steps e. and f., if necessary, until engine starts. (Cold engines are harder to start.)

l. If engine does not start after several attempts, see TROUBLESHOOTING procedures in Chapter 3 of this manual.

2-9. OPERATION

Check pressure gage reading. It should read between 140 and 175 psi (9.8 and 12.3 kg/cm²).

As soon as the engine is running, the compressor is ready to operate and inflate tires. If the compressor
not operate, see TROUBLESHOOTING procedures in Chapter 3 of this manual. Watch for any unusual
or vibration.

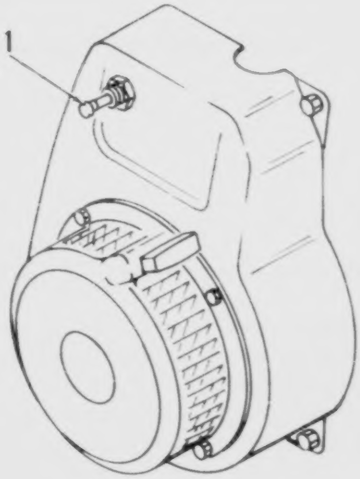
2-10. STOPPING

a. Set speed control lever to idle.

b. Push ignition switch (1) in (STOP).

c. Close fuel tank vent valve.

d. Turn fuel tank valve OFF.



2-11. PREPARATION FOR MOVEMENT

Stop the engine. Close fuel vent valve on fuel cap.

2-12. MOVEMENT TO A NEW WORKSITE

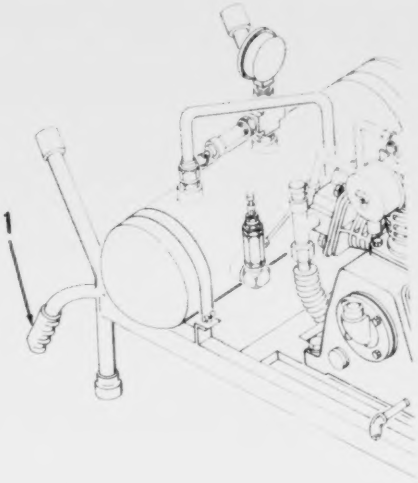
CAUTION

The wheels and axle of the compressor assembly are designed to move the compressor assembly into position at the worksite. They are not designed for use during road or highway movement of the compressor assembly.

a. Use a shipping dock or use wood planks as a ramp to load the compressor assembly on the bed of a suitable truck to transport the compressor assembly.

b. Grasp the handles (1) when moving the compressor assembly.

c. Secure the compressor assembly to the side of the truck to prevent it from shifting.



Section IV. OPERATION UNDER UNUSUAL CONDITIONS

2-13. OPERATION IN EXTREME COLD

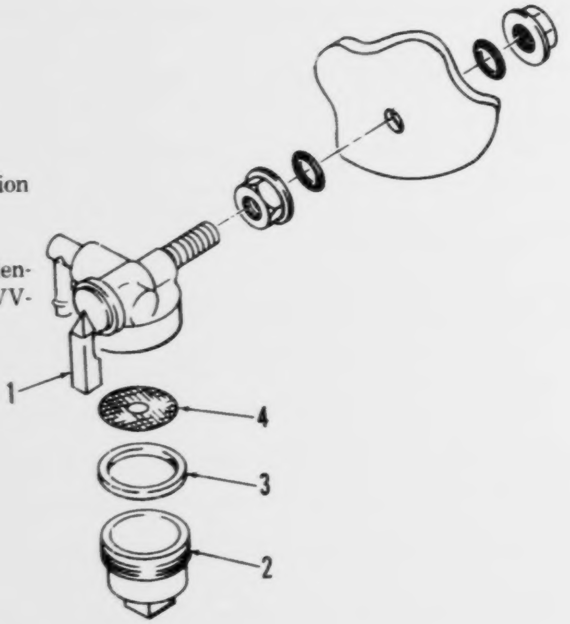
a. Keep entire unit free of ice and snow.

b. Cover unit when not in use.

c. Shelter unit from weather, if possible.

d. Use proper engine oil for cold weather operation (Appendix E, item 7).

e. Keep fuel tank full to prevent moisture condensation, which can freeze. Use FED-STD-VV-G-76 Class B gasoline.



f. Check and clean fuel strainer before and after operating to prevent an accumulation of moisture, which can freeze.

(1) Turn fuel cock lever (1) to OFF.

(2) Unscrew bowl (2), remove gasket (3) and screen (4) from strainer assembly.

(3) Clean parts with water and dry thoroughly.

(4) Reassemble strainer assembly.

(5) If unit is going into storage, leave fuel cock lever closed

g. Drain air tank after use to prevent moisture in tank from freezing.

(1) Open tank drain valve, leave open until air no longer hisses.

(2) When tank is no longer pressurized, close tank drain valve.

NOTE

If the engine resists starting and the temperature is below 0°F (-18°C), perform steps h. through y. to start a cold engine.

2-13 OPERATING IN EXTREME COLD (cont.)

h. Remove tension from the V-belts by loosening four engine mounting bolts and center strut bracket

i. Move the engine toward the rear of the unit until the belts are loose.

j. Tighten the two front engine mounting bolts.

k. Open the fuel cock.

l. Close the choke (turn fully clockwise).

m. Pull out ignition switch.

n. Adjust speed control lever at 1/3 travel.

CAUTION

Do not open fuel tank vent more than two turns to avoid loss of screw.

o. Open fuel cap vent (rotate two turns counterclockwise).

p. Pull rope on recoil starter until engine starts.

q. Slowly move choke to 1/2 open and allow engine to run for 15-30 seconds.

r. Increase speed control to 3/4 travel.

s. Slowly move choke to fully open position (turn fully counterclockwise), move speed control lever t
open position (fully counterclockwise).

t. Operate engine for 10-20 minutes.

u. Move speed control lever to 1/2 full open position for 2—3 minutes. Turn off engine.

v. Loosen two front engine mounting bolts.

w. Pull engine forward until proper tension is obtained on the V-belts (1/2-inch slack).

x. Tighten four engine mounting bolts and center strut brackets bolt.

y. Restart engine (steps k. through s.).

2-14. OPERATION IN EXTREME HEAT

a. If possible, protect the compressor assembly from direct rays of the sun.

b. Allow adequate space for ventilation. If the compressor is operated in an enclosure, use a fan to circulate air.

c. Keep the engine shrouding and compressor clean to provide proper heat transfer to the air.

d. Check drive belt for tension frequently. Improper drive belt tension often results in overheating.

e. Check that lubricants in the engine comply with Appendix E, item 5.

2-15. OPERATION IN HIGH ALTITUDES

The operating efficiency of both engine and compressor diminishes at higher altitudes. Make sure that the engine is operating at peak efficiency to provide the highest possible compressor output.

2-16. OPERATION IN SANDY OR DUSTY AREAS

a. When the compressor is operated under sandy or dusty conditions, service engine and compressor air cleaners frequently.

b. While filling the fuel tank, take care to prevent sand and dust from entering the fuel system.

c. Check fuel strainer bowl for accumulations of dirt.

(1) Turn fuel cock lever (1) to OFF.

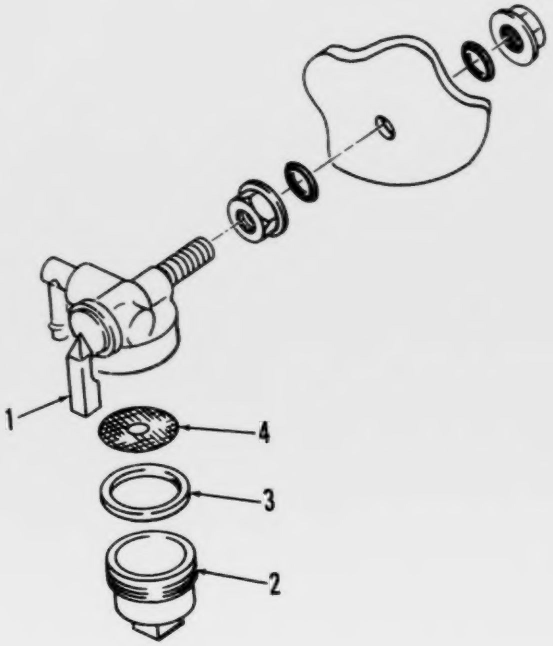
(2) Unscrew bowl (2), remove gasket (3), and screen (4) from strainer assembly. Discard gasket.

(3) Clean parts with water and dry thoroughly.

(4) Reassemble strainer assembly. Use new gasket.

(5) If unit is going into storage, leave fuel cock lever closed.

d. Protect unit with tarpaulin when not in use.



2-17. OPERATION UNDER RAINY OR HUMID CONDITIONS

a. Fill the fuel tank immediately after every operating period to prevent moisture in the air from conc
ing and entering the fuel system. Check the fuel strainer bowl frequently for collection of moisture

b. Take special care to prevent rust and corrosion of exposed metal surfaces.

2-18. OPERATION IN SALT WATER AREAS

a. Salt water causes corrosion. Use fresh water to wash off any salt water that comes in contact with the e
ment. Avoid using excess water around air cleaners, fuel tank vent, and electrical system. This will
prevent the formation of rust and corrosion.

b. Take special care to prevent rust and corrosion of exposed metal surfaces.

CHAPTER 3

UNIT MAINTENANCE INSTRUCTIONS

Section I. LUBRICATION INSTRUCTIONS

3-1. LUBRICATION METHODS.

a. General. Keep all lubricants in closed containers and store in a clean, dry place away from external heat. Keep container covers clean to prevent dirt, dust, or other foreign material from mixing with the lubricants. Keep all lubrication equipment clean and ready for use.

b. Cleaning. Keep all external parts not requiring lubrication free of lubricants. Before lubricating the equipment, wipe all lubrication points free of dirt and grease. Clean all lubrication points after servicing to prevent the accumulation of foreign matter.

c. Lubrication Points. Service the lubrication points at the proper intervals as specified in the lubrication procedure (para 3-2 and 3-3). The interval specified is based on normal operation. Modifications of the recommended interval may be required when operating under unusual conditions.

3-2. COMPRESSOR LUBRICATION PROCEDURE.

Perform the following procedure every 90 days to lubricate the air compressor.

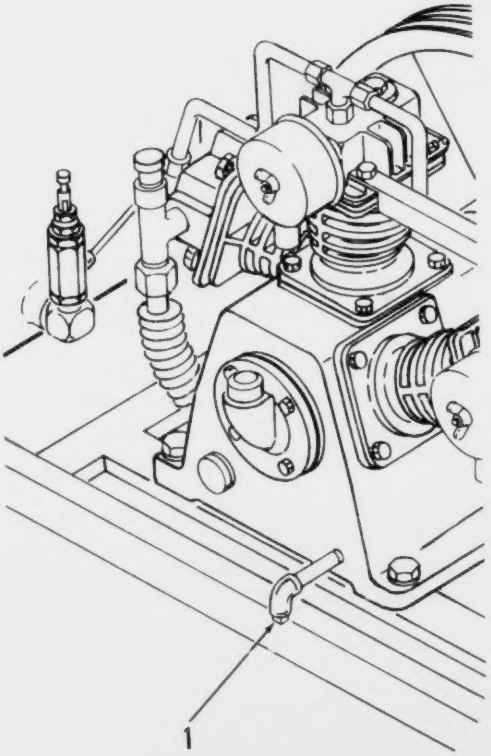
NOTE

These instructions are mandatory.

a. Place a suitable container under the air compressor oil drain plug (1).

b. Remove the drain plug (1) and allow the oil to completely drain from the crankcase

c. Reinstall the drain plug (1). Discard the used oil.

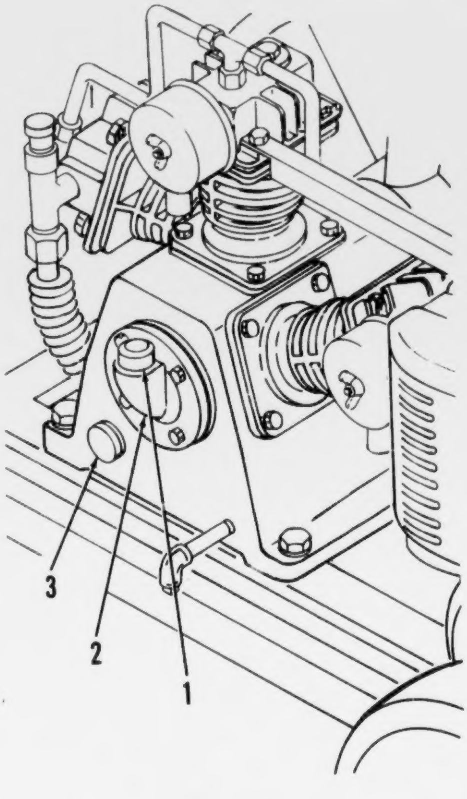


d. Remove the oil breather cap (1).

e. Fill the crankcase through the oil breather cap opening (2) with 1-3/4 pints (0.8 litre) of oil (Appendix E, item 5).

f. Check that oil level is in center of sight gage (3) to ensure that crankcase is properly filled with oil.

g. Reinstall the oil breather cap (1).



3-3. ENGINE LUBRICATION PROCEDURE

Perform the following procedure every 90 days to lubricate the engine.

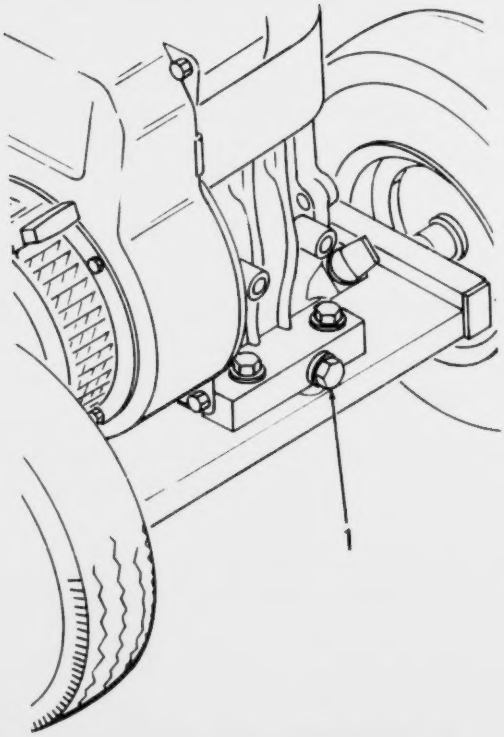
NOTE

These instructions are mandatory.

a. Place a suitable container under the engine oil drain plug (1).

b. Remove drain plug (1) and allow the oil to completely drain from the crankcase.

c. Reinstall drain plug (1). Discard used oil.



d. Remove oil dipstick (1). Unscrew handle to release, and pull dip stick out.

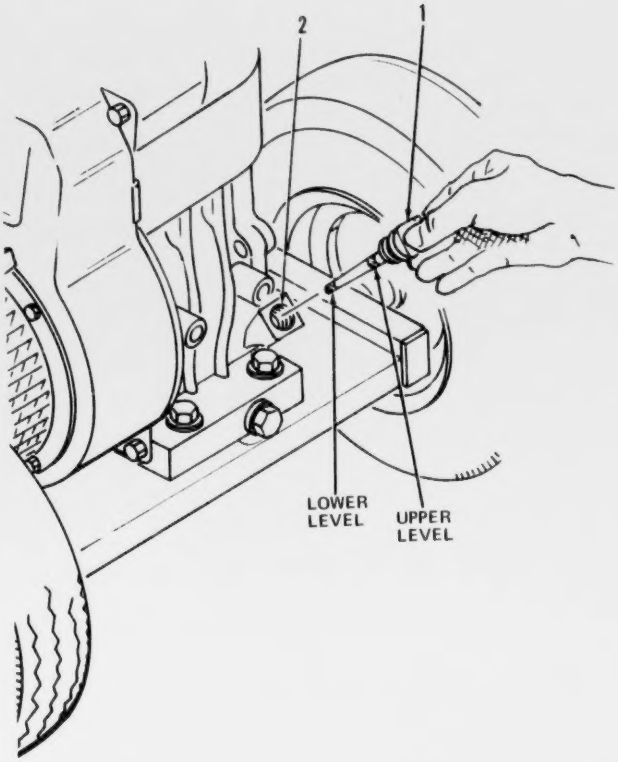
e. Fill crankcase through the dipstick opening (2) with 1-1/4 pints (0.6 litre) of oil (Appendix E, item 5).

NOTE

Do not thread dipstick in place to check level.

f. Check oil level with dipstick. Level should be between marks on the dipstick.

g. Install dipstick and screw in finger tight.



3-4. WHEEL BEARING LUBRICATION PROCEDURE

Perform the following procedure every 90 days to lubricate the wheel bearings.

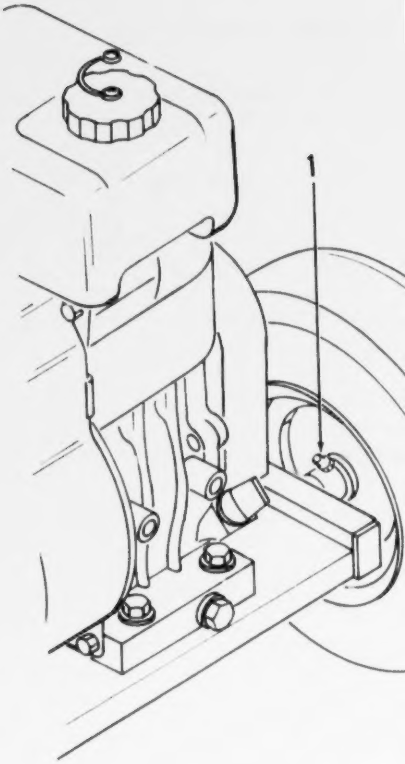
NOTE

These instructions are mandatory.

a. Wipe grease fittings(1), located on inner side of wheels, clean with a clean, lint-free cloth.

b. Lubricate grease fitting (1) with grease gun filled with automotive and artillery grease (Appendix E, item 4).

c. Clean excess grease from grease fittings (1) and bearings.



Section II. REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

3-5. COMMON TOOLS AND EQUIPMENT

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

3-6. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

No special tools and equipment are required to maintain the air compressor assembly at the unit maintenance level.

3-7. REPAIR PARTS

Repair parts are listed and illustrated in the repair parts and special tools list TM 5-4310-378-24P, Unit, Intermediate Direct Support and Intermediate General Support Maintenance Repair Parts and Special Tools List.

Section III. SERVICE (UNUSUAL) UPON RECEIPT OF EQUIPMENT

No unusual service is required upon receipt of compressor assembly.

Section IV. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

3-8. GENERAL.

a. The best way to maintain the air compressor assembly is to inspect on a regular basis so minor faults can be discovered and corrected before they result in serious damage, failure, or injury. This section contains systematic instructions for inspection, adjustment, and correction of the compressor components to avoid costly repairs or major breakdowns. This is Preventive Maintenance Checks and Services.

b. Report shortcomings on DA Form 2404, Equipment Inspection and Maintenance worksheet, immediately after the PMCS and before taking corrective action. They will also be reported in the equipment log.

c. Do your Before (B) PREVENTIVE MAINTENANCE before operation.

d. Do your During (D) PREVENTIVE MAINTENANCE during operation.

e. Do your After (A) PREVENTIVE MAINTENANCE after operation.

f. Do your Weekly (W) PREVENTIVE MAINTENANCE once each week.

g. Do your Monthly (M) PREVENTIVE MAINTENANCE once each month.

h. Do your Quarterly (Q) PREVENTIVE MAINTENANCE once each quarter.

i. If something doesn't work, troubleshoot it with the instructions in your manual or notify your supervisor.

j. Always do your PREVENTIVE MAINTENANCE in the same order so it gets to be a hab
Once you have had some practice, you will spot anything wrong in a hurry.

k. If anything looks wrong and you can't fix it, write in on your DA Form 2404. If you fin
something seriously wrong, report it to your supervisor RIGHT NOW.

l. When you do your PREVENTIVE MAINTENANCE, take along the tools you will need to
make all the checks. Take along a rag. You will always need at least one.

WARNING

Dry Cleaning Solvent
(Stoddard Solvent)
P-D-680

- Combustible - do not use near open flames, near welding areas, or on hot surfaces.
- Prolonged or repeated contact of skin with liquid can cause dermatitis. Repeated inhalation of vapor can irritate nose and throat and can cause dizziness.
- If any liquid contacts skin or eyes, immediately flush affected area thoroughly with water. Remove solvent-saturated clothing. If vapors cause dizziness, go to fresh air.
- When handling liquid or when applying it in an air-exhausted, partially covered tank, wear approved gloves.
- When handling liquid or when applying it at an unexhausted, uncovered tank or workbench, wear approved respirator, goggles, and gloves.

(1) Keep it clean: Dirt, grease, oil, and debris only get in the way and may cover u
serious problem. Clean as you work and as needed. Use cleaning solvent (Appen
item 2) on all metal surfaces. Use soap and water when you clean rubber or pla
material.

(2) Bolts, nuts, and screws: Check them all for obvious looseness, missing, bent, or
broken condition. You cannot try them all with a tool, of course, but look for c
paint, bare metal, or rust around bolt heads. If you find one you think is loose,
tighten it or report it to your supervisor if you cannot tighten it.

(3) Welds: Look for loose or chipped paint, rust, or gaps where parts are welded together. If you find a bad weld, report it to your supervisor.

(4) Electric wires and connectors: Look for cracked or broken insulation, bare wir
loose or broken connections. Make sure wires are in good shape.

Table 3-1. Unit Preventive Maintenance Checks and Services

B—Before D—During A—After W—Weekly M—Monthly Q—Quarterly

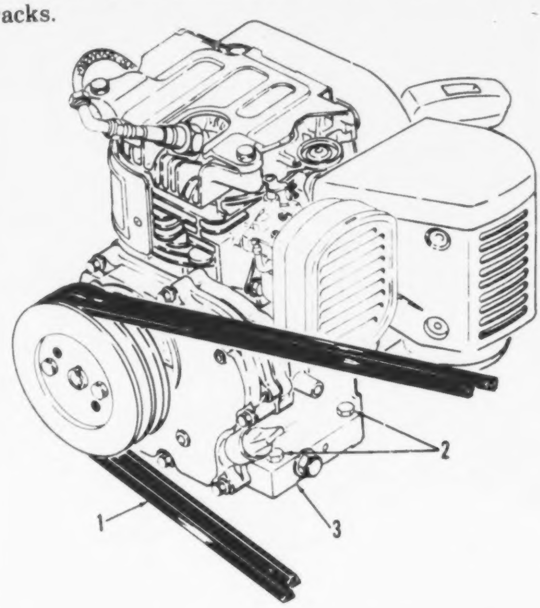
ITEM No.	INTERVAL						ITEM TO BE INSPECTED PROCEDURE:	EQUIPMENT IS NOT READY/AVAILABLE IF:
	B	D	A	W	M	Q		
1				•			**Drive Belts**. Inspect for damaged or broken belts. Check belt (1) tension for ⅜ to ½ inch deflection at mid-point between pulleys. To adjust belt tension, loosen the four engine hold-down bolts (2) and move engine (3) until belt tension is ⅜ to ½ inch. Tighten the four hold-down bolts (2).	Cracked, frayed, or broken.
2						•	**Drive Pulley**. Check for tightness of mounting and cracks. 	Loose or cracked.
3						•	**Engine Cylinder Head and Gasket**. Inspect cylinder head for secure mounting. Inspect gasket to ensure it does not have any holes.	Looseness or holes in gasket.
4						•	**Mounting Hardware**. Check all hardware for secure mounting and damage. Tighten all loose hardware. Replace all damaged hardware.	Loose or missing hardware.

Table 3-1. Unit Preventive Maintenance Checks and Services (Continued)

B—Before D—During A—After W—Weekly M—Monthly Q—Quarterly

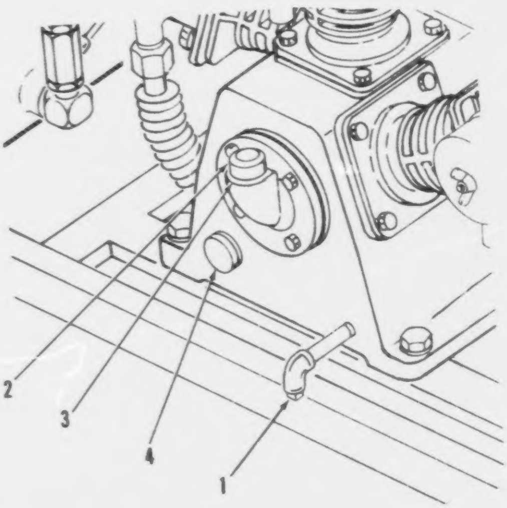
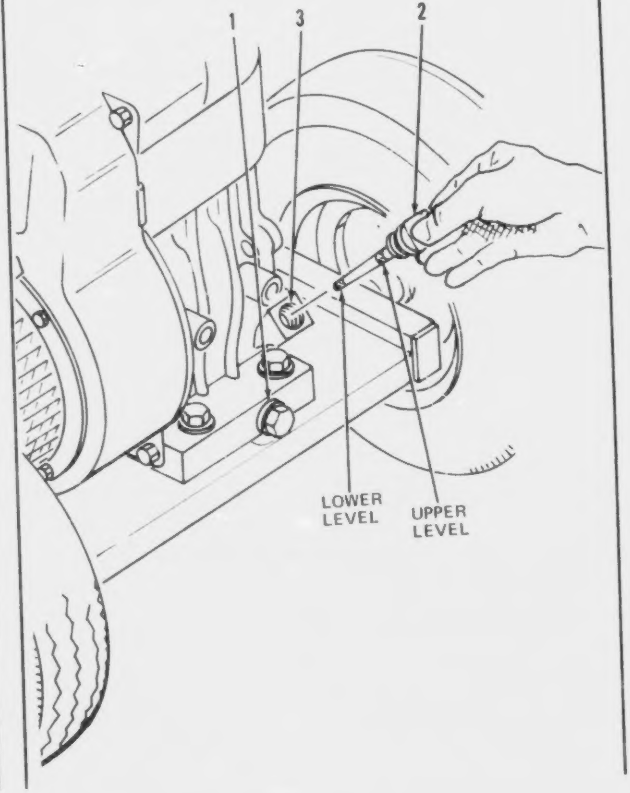
ITEM No.	INTERVAL						ITEM TO BE INSPECTED PROCEDURE:	EQUIPMENT IS NOT READY/AVAILABLE I
	B	D	A	W	M	Q		
5						•	**Compressor Oil.** Change the compressor oil as follows: Remove the drain plug (1) and allow the oil to completely drain into a suitable container. Reinstall drain plug (1). Remove oil breather cap (2). Fill the crankcase through the breather cap opening (3) with 1¾ pints of oil (Appendix E, item 5). Check sight gage (4) for proper oil level. Reinstall oil breather cap (2). 	

Table 3-1. Unit Preventive Maintenance Checks and Services (Continued)

B—Before D—During A—After W—Weekly M—Monthly Q—Quarterly

ITEM No.	INTERVAL						ITEM TO BE INSPECTED PROCEDURE:	EQUIPMENT IS NOT READY/AVAILABLE IF:
	B	D	A	W	M	Q		
6						•	**Engine Oil.** Change the engine oil as follows: Remove the drain plug (1) and allow the oil to completely drain into a suitable container. Reinstall drain plug (1). Remove dipstick (2). Fill the crankcase through the dipstick opening (3) with 1¼ pints (0.6 1) of oil (Appendix E, item 5). Check dipstick (2) do not thread in place for proper oil level. Install dipstick and screw in finger tight. (Refer to para 3-3.)  	

All data on Pages 3-10 through 3-13 deleted.

Section V. TROUBLESHOOTING

3-9. GENERAL

a. The table in this section lists the common malfunctions which you may find during the operation or maintenance of the air compressor or its components. You should perform the test/inspection and corrective maintenance in the order listed.

b. This manual cannot list all malfunctions that may occur, nor all test or inspections and corrective actions. If a malfunction is not listed or it is not corrected by the listed corrective action, notify your supervisor.

Table 3-2. Unit Maintenance Troubleshooting

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

1. ENGINE/COMPRESSOR BEARINGS OVERHEAT.

Check that proper oil level is visible through sight gage or engine dipstick.

If oil level is low, add oil to crankcase.

If oil level is normal, notify Forward Intermediate Maintenance.

2. ENGINE/COMPRESSOR SPEED SLOWS DOWN.

Check engine speed control or governor setting.

If engine speed control setting is abnormal, correct setting.

If engine speed control or governor setting are normal, replace engine.

3. SEVERE VIBRATION.

Step 1. Check for damaged engine pulley and damaged compressor flywheel.

If engine pulley or compressor flywheel is damaged, replace damaged part.

Step 2. Observe engine and compressor pulleys while air compressor is running.

If engine pulley is wobbling, replace engine.

If compressor flywheel is wobbling, replace compressor.

4. LITTLE OR NO AIR PRESSURE BUILDUP.

Step 1. Inspect for leaking drain valve.

If drain valve is leaking, replace the drain valve.

If drain valve is not leaking, proceed to step 2.

Table 3-2. Unit Maintenance Troubleshooting (Continued)

MALFUNCTION
    TEST OR INSPECTION
        CORRECTIVE ACTION

Step 2. Inspect for leaks by applying a Leak Teck to valve body.

Pull out ring and release, valve should seat.

If safety valve is leaking or defective, replace safety valve.

If safety valve is not leaking or defective, proceed to step 3.

Step 3. Check for leaking or broken tubing.

If tubing is defective, replace defective tubing.

If the above steps do not correct the malfunction, notify Forward Intermediate Maintenance.

5. PRESSURE GAGE INACCURATE.

Check for damaged/defective pressure gage.

Replace damaged/defective pressure gage.

6. EXCESSIVE OIL CONSUMPTION.

Notify Forward Intermediate Maintenance.

7. BELTS SLIP.

Step 1. Inspect for worn belts.

If belts are worn, replace with new belts.

If belts are not worn, proceed to step 2.

Step 2. Inspect for proper belt tension (Table 3-1).

If belt tension is improper, adjust belt tension (Table 3-1).

8. ENGINE OVERHEATS

Check for oil level in crankcase, cooling fins clean, engine shrouds properly installed.

If oil level is low, add oil.

If cooling fins are dirty or caked with mud, clean them.

If shrouds are incorrectly installed or missing, install them correctly.

Table 3-2. Unit Maintenance Troubleshooting (Continued)

MALFUNCTION
  TEST OR INSPECTION
    CORRECTIVE ACTION

---

9. ENGINE WILL NOT START.

Step 1. Loosen belt and try to turn compressor by hand.

If compressor does not turn, replace compressor.

If compressor turns, proceed to step 2.

Step 2. Check for proper operation of On/Off switch.

If On/Off switch is defective, replace On/off switch.

If On/Off switch is not defective, notify Forward Intermediate Maintenance.

SECTION VI. MAINTENANCE PROCEDURES

3-10. GENERAL. This section contains the step-by-step procedures for performing maintenance for the compressor assembly. Personnel required are listed only if the task requires more than one. If personnel are not listed, it means one person can do the task.

3-11. BELT GUARD ASSEMBLY

This task covers:

Replacement

Tools:
7/16-in. wrench
1/2-in. wrench

Materials: Brush, Cleaning (Appendix E, item 1)
Rag, Wiping (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2)
Belt Guard Assembly

Equipment Condition: Ignition switch pushed in (Table 2-1, 8).

Replacement. Replace defective belt guard assembly (1).

a. Removal.

(1) Use 7/16-in. and 1/2-in. wrenches and remove two locknuts, two flat washers, and two bolts from ends of belt guard.

(2) Use 7/16-in. wrench and remove two bolts, two flat washers, and two lock washers from lower side of belt guard.

(3) Use 7/16-in. wrench and remove one bolt and one lock washer from upper side of belt guard (at compressor bracket).

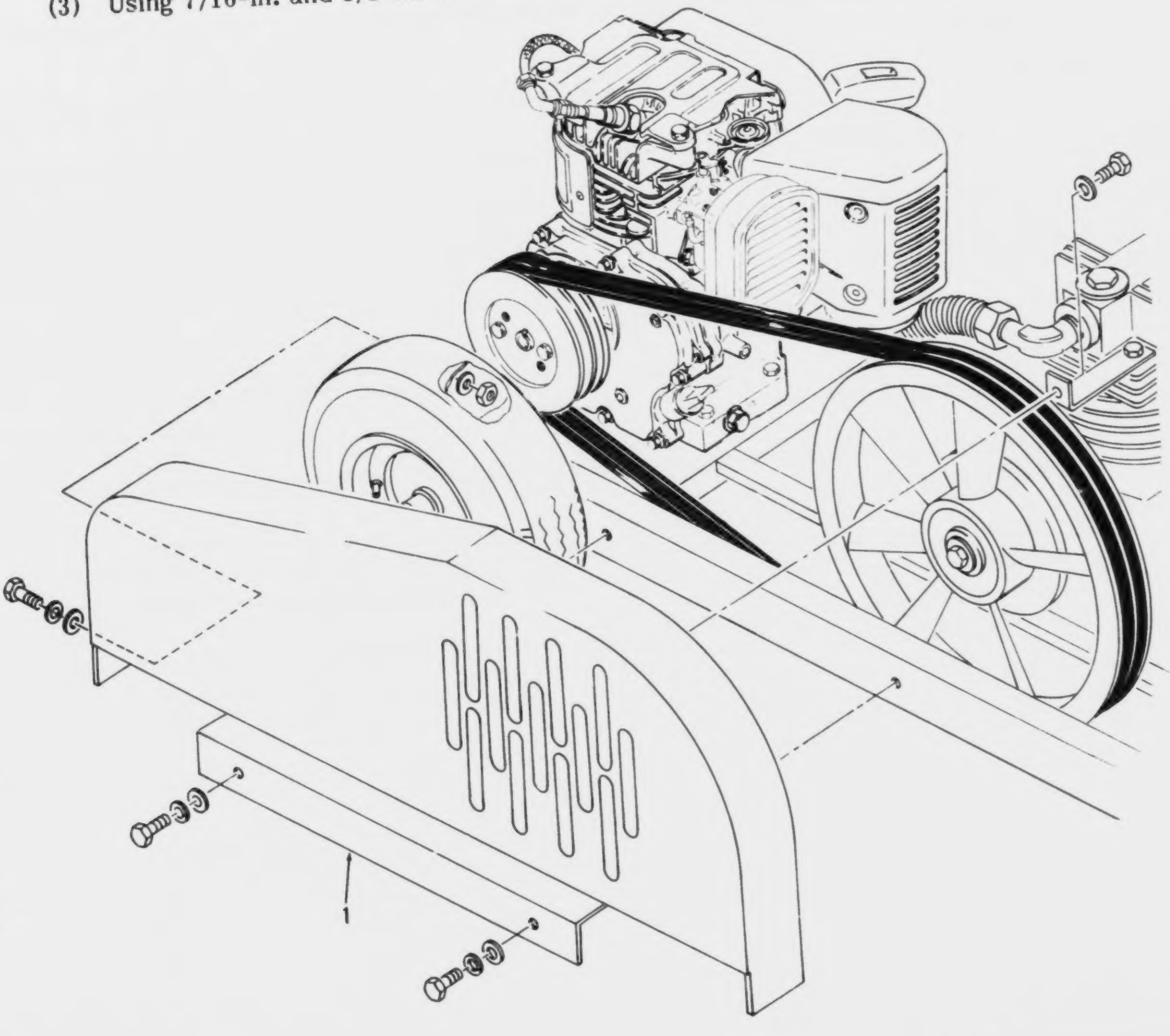
(4) Remove belt guard.

b. Installation.

(1) Obtain serviceable belt guard and locate on the compressor unit.

(2) Start attaching parts, one bolt and one lock washer at upper bracket; two bolts, two flat washers, and two lock washers on lower side; and one bolt, one flat washer, and one locknut on each end of belt guard.

(3) Using 7/16-in. and 1/2-in. wrenches tighten all nuts and bolts equally.



3-12. MATCHED SET V - BELTS

This task covers:

Replacement

Tools:
7/16-in. wrench or 7/16-in. socket with handle
1/2-in. wrench and 1/2-in. socket with handle

Materials: Brush, Cleaning (Appendix E, item 1)
Rag, Wiping (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2)
V-Belt set

Equipment Condition: Ignition switch pushed in (Table 2-1, 8).
Belt guard assembly removed (Para 3-11).

Replacement. Replace defective V-belt set.

a. Removal.

(1) Using 7/16-in. wrench and 7/16-in. socket and handle, loosen strut adjustment bolt and nut.

(2) Using 1/2-in. wrench and 1/2-in. socket and handle loosen engine mounting bolts.

(3) Slide engine along the frame toward the compressor until the V-belts are slack.

(4) Remove V-belts.

b. Installation.

(1) Place V-belts over the two pulleys.

(2) Slide engine along the frame away from the compressor until there is 1/2-inch deflection of the V-belts between the pulleys.

(3) Using 1/2-in. wrench and 1/2-in. socket and handle, tighten engine mounting hardware.

(4) Using 7/16-in. wrench and 7/16-in. socket and handle, tighten strut adjustment bolt and nut.

3-13. DRIVE PULLEY

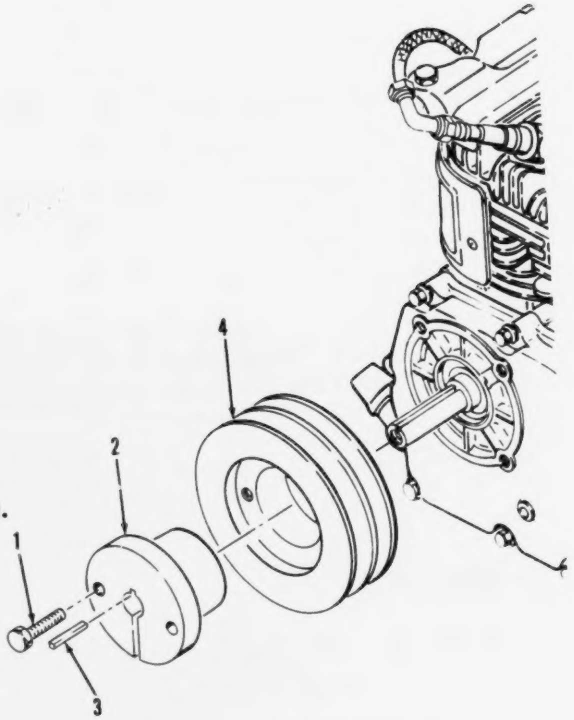
This task covers:

Replacement

Tools:
7/16-in. wrench

Materials: Brush, Cleaning (Appendix E, item 1)
Rag, Wiping (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2)
Drive Pulley

Equipment Condition: Ignition switch pushed in (Table 2-1, 8).
Belt guard assembly removed (Para 3-11).
V-belt set removed (Para 3-12).



Replacement. Replace defective drive pulley.

a. Removal.

(1) Using 7/16-in. wrench, remove two bolts (1) from drive pulley bushing (2).

(2) Remove bushing (2) and key (3) from drive pulley sheave (4).

(3) Pull sheave (4) from engine crankshaft.

b. Installation.

(1) Push drive pulley sheave (4) onto engine crankshaft.

(2) Align key (3) and bushing (2) and push them onto engine crankshaft.

(3) Align two bolt holes in bushing with two bolt holes in sheave and insert two bolts.

(4) Using 7/16-in. wrench, tighten bolts.

3-14. COMPRESSOR ASSEMBLY

This task covers:

a. Inspection b. Replacement

Tools:
7/16-in. wrench and 7/16-in. socket and handle
1/2-in. wrench
13/16-in. wrench
24-mm wrench

Materials: Brush, Cleaning (Appendix E, item 1)
Rag, Wiping (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2)
Compressor Assembly

Equipment Condition: Ignition switch pushed in (Table 2-1, 8).
Belt guard assembly removed (para 3-11).
V-belts removed (para 3-12).

a. Inspection.

WARNING

Dry Cleaning Solvent
(Stoddard Solvent)
P-D-680

- Combustible - do not use near open flames, near welding areas, or on hot surfaces.
- Prolonged or repeated contact of skin with liquid can cause dermatitis. Repeated inhalation of vapor can irritate nose and throat and can cause dizziness.
- If any liquid contacts skin or eyes, immediately flush affected area thoroughly with water. Remove solvent-saturated clothing. If vapors cause dizziness, go to fresh air.
- When handling liquid or when applying it in an air-exhausted, partially covered tank, wear approved gloves.
- When handling liquid or when applying it at an unexhausted, uncovered tank or workbench, wear approved respirator, goggles and gloves.

(1) Clean compressor as necessary to perform inspection. Use brush, cloth, and solvent as required.

(2) Inspect compressor for excess wear or damage.

b. Replacement.

(1) Removal

(a) Using 13/16-in. wrench, undo aftercooler assembly at compressor, loosen at tank enough to rotate aftercooler parallel to tank.

(b) Using 1/2-in. wrench, undo pilot valve to compressor tube at pilot valve. Loosen tube at valve end.

(c) Using 7/16-in. wrench and 7/16-in. socket and handle, remove strut adjustment nut and bolt.

(d) Using 1/2-in. socket wrench and handle, and 1/2-in. wrench, remove four nuts, four bolts, and eight flat washers securing compressor assembly to frame.

(e) Using 24-mm wrench, remove low pressure to high pressure cooling tube to remove compressor mounting bolt.

(f) Remove compressor assembly.

(2) Installation

(a) Using 24-mm wrench, loosen low pressure to high pressure cooling tube to insert compressor mounting bolt below it. Tighten cooling tube.

(b) Locate compressor assembly on frame and insert remaining three bolts through mounting holes.

(c) Thread nuts onto bolts, and using 1/2-in. socket and handle and 1/2-in. wrench, tighten mounting hardware equally.

(d) Using 7/16-in. wrench and 7/16-in. socket and handle, install strut adjustment nut and bolt.

(e) Using 1/2-in. wrench install pilot valve to compressor tube at valve end.

(f) Rotate aftercooler to install on compressor and install with 13/16-in. wrench.

3-15. TUBE ASSEMBLIES

This task covers:
a. Inspection b. Replacement

Tools:
1/2-in. wrench
19-mm wrench
24-mm wrench

Materials:
Brush, Cleaning (Appendix E, item 1)
Rag, Wiping (Appendix E, item 3)
Solvent, Dry cleaning (Appendix E, item 2)

Equipment Condition: Ignition switch pushed in (Table 2-1, 8).
Tank drain valve open and air bleed off (Table 3-1).

a. Inspection.

(1) Inspect intercooler tubing for damage (1).

(2) Inspect aftercooler for damage (2).

(3) Inspect unloader valve tubing for damage (3).

(4) Inspect tee fittings and elbows for damage.

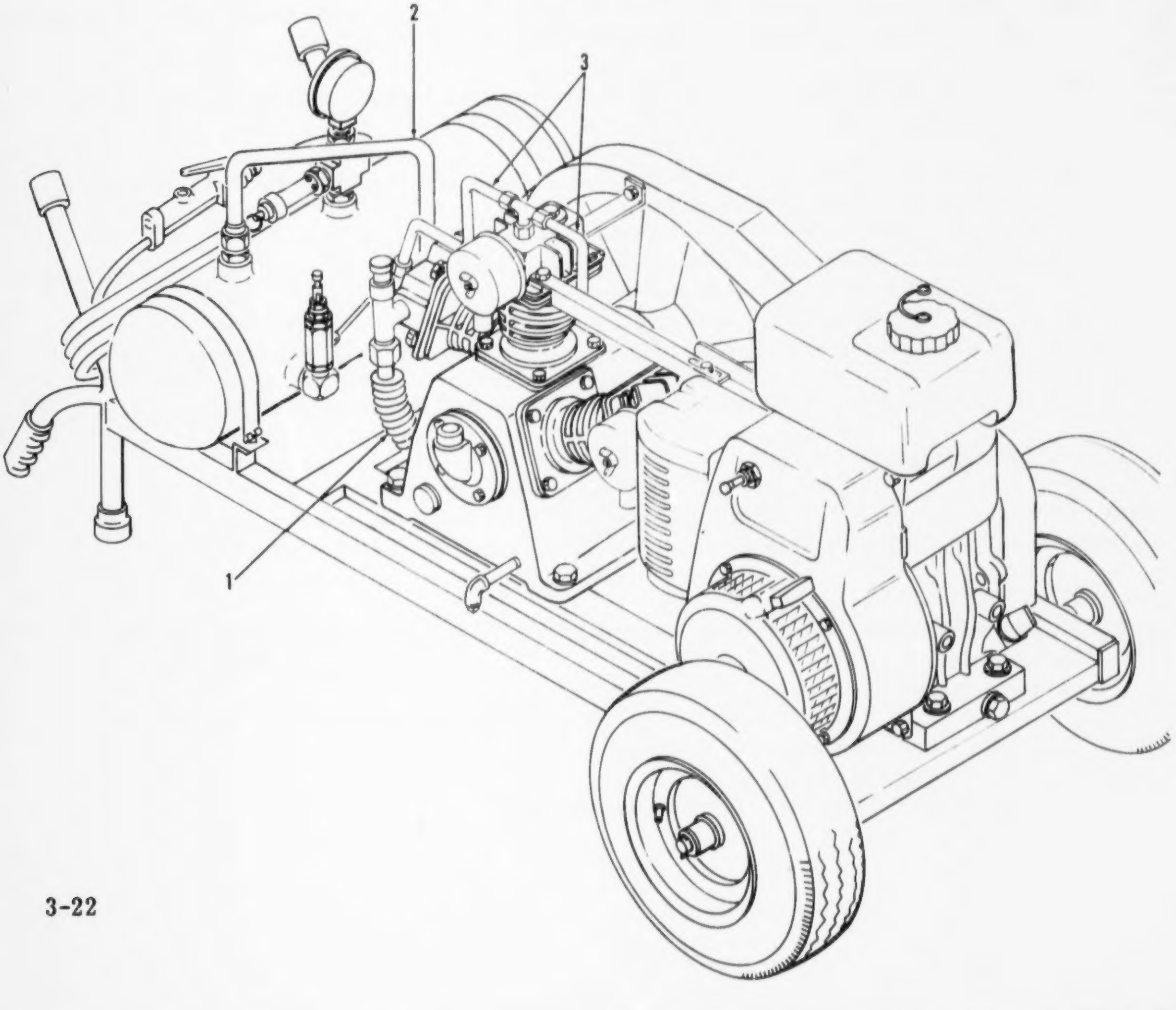
b. Replacement. Replace defective tube assemblies, tee fittings, and elbows as follows:

(1) Removal

(a) Undo nuts at each end of a defective tube.

(b) Remove tube from compressor.

(c) If fitting is to be removed, undo tube nuts and pull end of tube away enough to remove fitting.



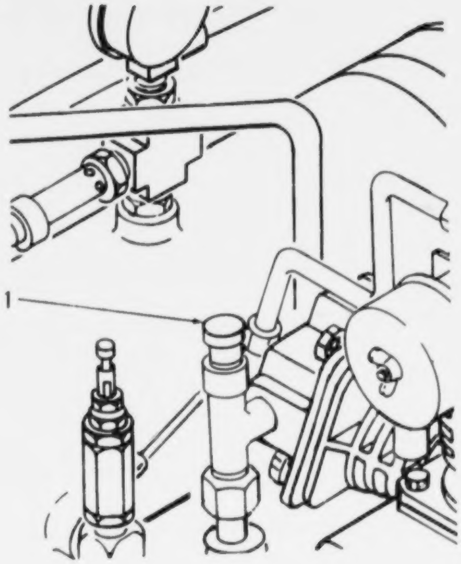
(2) Installation

(a) Install fittings removed in step c.

(b) Fit tubes into place and start nuts on each end onto their fittings.

(c) Tighten tube nuts to secure the assembly.

3-16. INTERSTAGE RELIEF VALVE



This task covers:

a. Inspection b. Replacement

Tools:
5/8-in. wrench

Materials:	Brush, Cleaning (Appendix E, item 1) Rag, Wiping (Appendix E, item 3) Solvent, Dry Cleaning (Appendix E, item 2) Interstage Safety Valve
Equipment Condition:	Ignition switch pushed in (Table 2-1, 8).

a. Inspection

WARNING

Dry Cleaning Solvent
(Stoddard Solvent)
P-D-680

- Combustible - do not use near open flames, near welding areas, or on hot surfaces.
- Prolonged or repeated contact of skin with liquid can cause dermatitis. Repeated inhalation of vapor can irritate nose and throat and can cause dizziness.
- If any liquid contacts skin or eyes, immediately flush affected area thoroughly with water. Remove solvent-saturated clothing. If vapors cause dizziness, go to fresh air.
- When handling liquid or when applying it in an air-exhausted, partially covered tank, wear approved gloves.
- When handling liquid or when applying it at an unexhausted, uncovered tank or workbench, wear approved respirator, goggles, and gloves.

(1) Clean interstage safety valve (1) as necessary to perform inspection. Use brush, rag, and solvent as required.

(2) Inspect for leaking, wear or damage.

b. Replacement. Replace defective interstage relief valve as follows:

(1) Removal

(a) Using 5/8-in. wrench, remove interstage relief valve.

(2) Installation

(a) Install interstage relief valve.

3-17. COMPRESSOR AIR CLEANER

This task covers:

Replacement

Tools:
Pipe wrench, adjustable jaw, one to two inches capacity.

Materials: Brush Cleaning (Appendix E, item 1)
Rag, Wiping (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2)
Compressor Air Cleaner Assembly

Equipment Condition: Ignition switch pushed in (Table 2-1, 8).

Replacement. Replace defective air cleaner assembly as follows:

a. Removal.

WARNING

Dry Cleaning Solvent
(Stoddard Solvent)
P-D-680

- Combustible - do not use near open flames, near welding areas, or on hot surfaces.
- Prolonged or repeated contact of skin with liquid can cause dermatitis. Repeated inhalation of vapor can irritate nose and throat and can cause dizziness.
- If any liquid contacts skin or eyes, immediately flush affected area thoroughly with water. Remove solvent-saturated clothing. If vapors cause dizziness, go to fresh air.
- When handling liquid or when applying it in an air-exhausted, partially covered tank, wear approved gloves.
- When handling liquid or when applying it at an unexhausted, uncovered tank or workbench, wear approved respirator, goggles, and gloves.

(1) Clean compressor head, as necessary, using a clean, soft cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1) and cleaning solvent (Appendix E, item 2).

(2) Using pipe wrench, carefully remove air cleaner assembly. Grip body (1).

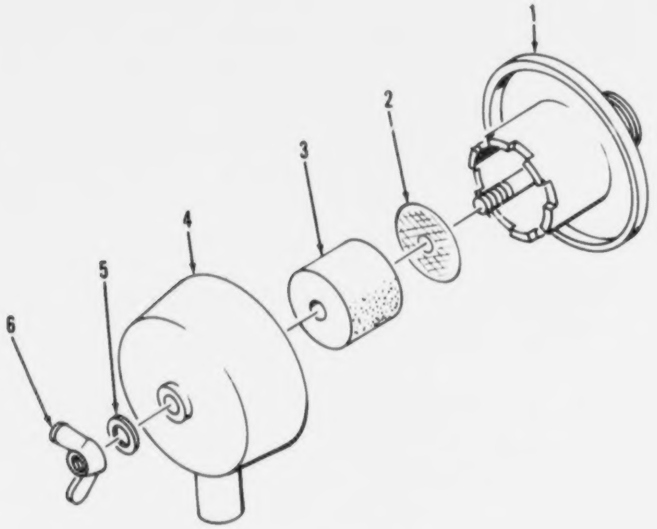
b. Installation.

(1) Disassemble air cleaner and check to make certain that all parts are accounted for.

(2) Using pipe wrench, install air cleaner body on cylinder head.

(3) Install screen (2), filter (3), and cover (4).

(4) Install washer (5) and wing nut (6) and tighten wing nut to secure the complete assembly.



3-18. OIL FILLER CAP AND SIGHT GLASS

This task covers:

Replacement

Tools:
Pliers, Slip Joint

Materials:
Oil Filler Cap
Sight Glass
Sight Glass Seal

Equipment Condition:
Ignition switch pushed in (Table 2-1, 8).
Compressor crankcase drained (para 3-2).

Replacement

a. Removal.

(1) Unscrew and remove oil filler cap.

(2) Using a pair of pliers remove sight glass and sight glass seal. Discard seal.

b. Installation.

(1) Install new sight glass seal and sight glass.

(2) Install oil filler cap or crankcase.

(3) Fill crankcase with oil per paragraph 3-2.

3-19. COMPRESSOR FLYWHEEL

This task covers:

a. Inspection b. Replacement

Tools:
13-mm Wrench
Gear Puller

Materials:
Brush, Cleaning (Appendix E, item 1)
Rag, Wiping (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2)
Compressor Flywheel
Flywheel Thrust Washer
Flywheel Thrust Bolt

Equipment Condition:
Ignition switch pushed in (Table 2-1, 8).
Tank drain valve open and air bleed off (Table 3-1)
Belt guard assembly removed (para 3-11).
V-belts removed (para 3-12).

a. Inspection.

(1) Inspect for missing or damaged hardware.

(2) Inspect compressor flywheel for damage

b. Replacement Replace defective compressor flywheel as follows:

(1) Removal

(a) Remove flywheel thrust bolt and washer.

(b) Using gear puller, remove flywheel.

WARNING

Dry Cleaning Solvent
(Stoddard Solvent)
P-D-680

- Combustible - do not use near open flames, near welding areas, or on hot surfaces.
- Prolonged or repeated contact of skin with liquid can cause dermatitis. Repeated inhalation of vapor can irritate nose and throat and can cause dizziness.
- If any liquid contacts skin or eyes, immediately flush affected area thoroughly with water. Remove solvent-saturated clothing. If vapors cause dizziness, go to fresh air.
- When handling liquid or when applying it in an air-exhausted, partially covered tank, wear approved gloves.
- When handling liquid or when applying it at an unexhausted, uncovered tank or workbench, wear approved respirator, goggles, and gloves.

(2) Installation

(a) Use brush, rag, and solvent as necessary to clean compressor crankcase before installing flywheel.

(b) Install flywheel and secure with thrust washer and thrust bolt.

3-20. UNLOADER VALVE ASSEMBLIES

This task covers:

a. Inspection b. Replacement

Tools: 17-mm wrench

Materials:
Auto Unloader Piston Packing (3 each)
Brush, Cleaning (Appendix E, item 1)
Rag, Wiping (Appendix E, item 3)
Solvent, Dry cleaning (Appendix E, item 2)

Equipment Condition:
Ignition switch pushed in (Table 2-1, 8)
Tank drain valve open and air bleed off (Table 3-1).
Air cleaners removed (para 3-17).
Tubing assemblies, elbow, and tees removed (para 3-15).

a. Inspection

WARNING

Dry Cleaning Solvent
(Stoddard Solvent)
P-D-680

- Combustible - do not use near open flames, near welding areas, or on hot surfaces.
- Prolonged or repeated contact of skin with liquid can cause dermatitis. Repeated inhalation of vapor can irritate nose and throat and can cause dizziness.
- If any liquid contacts skin or eyes, immediately flush affected area thoroughly with water. Remove solvent-saturated clothing. If vapors cause dizziness, go to fresh air.
- When handling liquid or when applying it in an air-exhausted, partially covered tank, wear approved gloves.
- When handling liquid or when applying it at an unexhausted, uncovered tank or workbench, wear approved respirator, goggles, and gloves.

(1) Clean, as necessary, using a clean, soft cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1) and cleaning solvent (Appendix E, item 2).

(2) Inspect for missing or damaged hardware.

b. Replacement. Replace defective unloader valves as follows:

(1) Removal

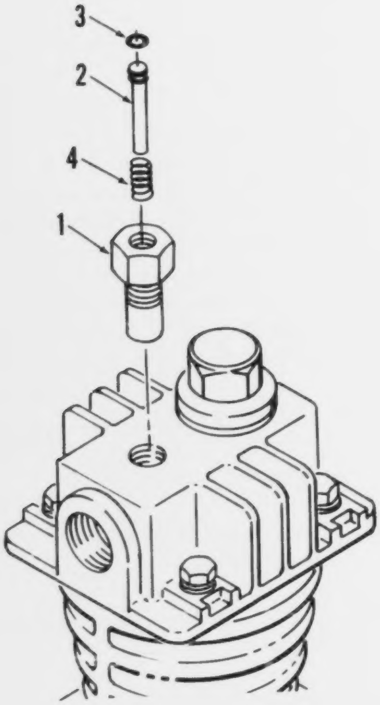
(a) Remove auto-unloader cylinder (1),auto-unloader piston (2), packing (3), and spring (4). Discard packing.

(2) Installation

(a) Install new packing (3) on piston (2).

(b) Insert spring (4) and piston (2) with packing (3) into cylinder (1).

(c) Install cylinder (1) into cylinder head.



3-21. ENGINE ASSEMBLY

This task covers:

a. Inspection b. Replacement

Tools:
1/2-in. wrench and 1/2-in. socket with handle

Materials: Brush, Cleaning (Appendix E, item 1)
Rag, Wiping (Appendix E, item 3)
Solvent, Dry cleaning (Appendix E, item 2)
Engine Assembly

Equipment Condition: Ignition switch pushed in (Table 2-1, 8).
Fuel tank drained (Table 2-1, 7).
V-belts removed (para 3-12).
Driving pulley and key removed (para 3-13).

a. Inspection.

WARNING

Dry Cleaning Solvent
(Stoddard Solvent)
P-D-680

- Combustible - do not use near open flames, near welding areas, or on hot surfaces.
- Prolonged or repeated contact of skin with liquid can cause dermatitis. Repeated inhalation of vapor can irritate nose and throat and can cause dizziness.
- If any liquid contacts skin or eyes, immediately flush affected area thoroughly with water. Remove solvent-saturated clothing. If vapors cause dizziness, go to fresh air.
- When handling liquid or when applying it in an air-exhausted, partially covered tank, wear approved gloves.
- When handling liquid or when applying it at an unexhausted, uncovered tank or workbench, wear approved respirator, goggles, and gloves.

(1) Use brush, rag, and solvent as necessary to clean engine to facilitate engine inspection.

(2) Inspect engine for loose, or broken parts, clogged cooling fins, frayed recoil starter rope.

(3) Inspect engine for wobbly crankshaft.

b. Replacement.

(1) Removal

(a) Remove four nuts and bolts and eight washers securing engine to frame.

(b) Lift engine from frame and discard in accordance with local regulations.

(2) Installation

(a) Set replacement engine on frame and insert four bolts thru washers, the engine, and the frame.

(b) Install another washer and a nut on each bolt. Do not tighten until the V-belts are set and adjusted.

-22. FUEL TANK AND FUEL FILTER ASSEMBLIES

This task covers:

a. Service b. Replacement

Tools:
7/16-in. Wrench
Pliers, Slip Joint
10-mm Wrench
14-mm Wrench

Materials:
Brush, Cleaning (Appendix E, item 1)
Rag, Wiping (Appendix E, Item 3)
Solvent, Dry Cleaning (Appendix E, item 2)
Fuel Tank Assembly
Fuel Filter Assembly
Fuel Line Assembly

Equipment Condition:
Ignition switch pushed in (Table 2-1, 8).
Fuel tank drained (Table 2-1, 7).

a. Service.

WARNING

(Stoddard Solvent)
P-D-680

- Combustible - do not use near open flames, near welding areas, or on hot surfaces.
- Prolonged or repeated contact of skin with liquid can cause dermatitis. Repeated inhalation of vapor can irritate nose and throat and can cause dizziness.
- If any liquid contacts skin or eyes, immediately flush affected area thoroughly with water. Remove solvent-saturated clothing. If vapors cause dizziness, go to fresh air.
- When handling liquid or when applying it in an air-exhausted, partially covered tank, wear approved gloves.
- When handling liquid or when applying it at an unexhausted, uncovered tank or workbench, wear approved respirator, goggles, and gloves.

(1) Clean fuel filter as necessary using brush, rag, and solvent.

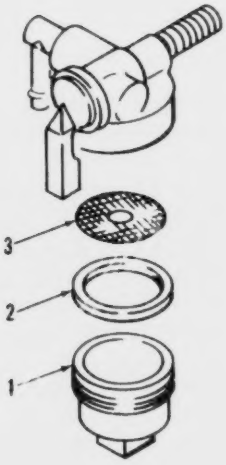
(2) Remove and discard bowl (1), gasket (2), and screen (3).

CAUTION

Do not overtighten bowl in step 3.

(3) Install fuel strainer repair kit consisting of: bowl (1), gasket (2), and screen (3).

(4) Remove fuel tank filler cover and extract fuel strainer from tank.



WARNING

Dry Cleaning Solvent (Stoddard Solvent)

P-D-680

- Combustible - do not use near open flames, near welding areas, or on hot surfaces.
- Prolonged or repeated contact of skin with liquid can cause dermatitis. Repeated inhalation of vapor can irritate nose and throat and can cause dizziness.
- If any liquid contacts skin or eyes, immediately flush affected area thoroughly with water. Remove solvent-saturated clothing. If vapors cause dizziness, go to fresh air.
- When handling liquid or when applying it in an air-exhausted, partially covered tank, wear approved gloves.
- When handling liquid or when applying it at an unexhausted, uncovered tank or workbench, wear approved respirator and goggles.

(5) Clean fuel strainer by back flushing with solvent.

(6) Shake off dirt and excess solvent.

(7) Install fuel strainer in fuel tank. Replace cover.

b. Replacement.

(1) Removal

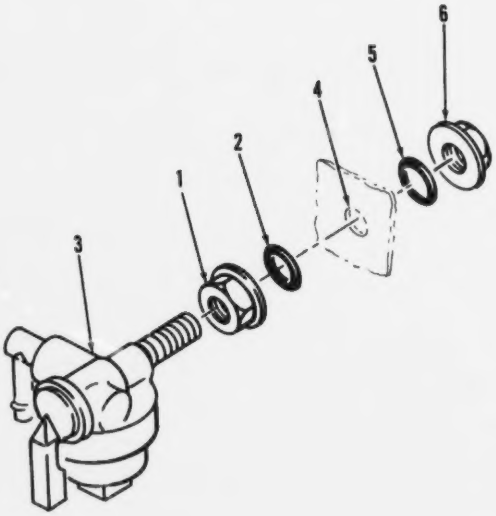
(a) Disconnect fuel hose assembly from carburetor.

(b) Remove fuel tank cover and reach into fuel tank to remove mounting bolt from fuel filter assembly.

(c) Remove fuel filter assembly with two nuts (1, 6) and two packings (2, 5). Discard packings.

(d) With 7/16-in. wrench, remove 4 bolts, 2 flat washers and 2 lock washers from the fuel tank.

(e) Lift fuel tank from top of engine.



(2) Installation

(a) Obtain replacement fuel tank and place it on top of engine.

(b) Line up mounting holes, and install two 1/4-20 x 1/2 inch bolts, two 1/4-20 x 1 inch bolts, four lock washers, and two flat washers.

(c) Tighten bolts to hold fuel tank securely.

(d) If fuel shutoff valve is not already installed on the fuel tank, obtain replacement.

(e) Install fuel shutoff valve with one nut and one packing on each side of fuel tank wall. Packings must be against the wall. Align valve with fuel line.

(f) Tighten mounting nuts.

(g) Connect fuel hose assembly to carburetor.

3-23. DUCTS, COVERS, AND DEFLECTORS

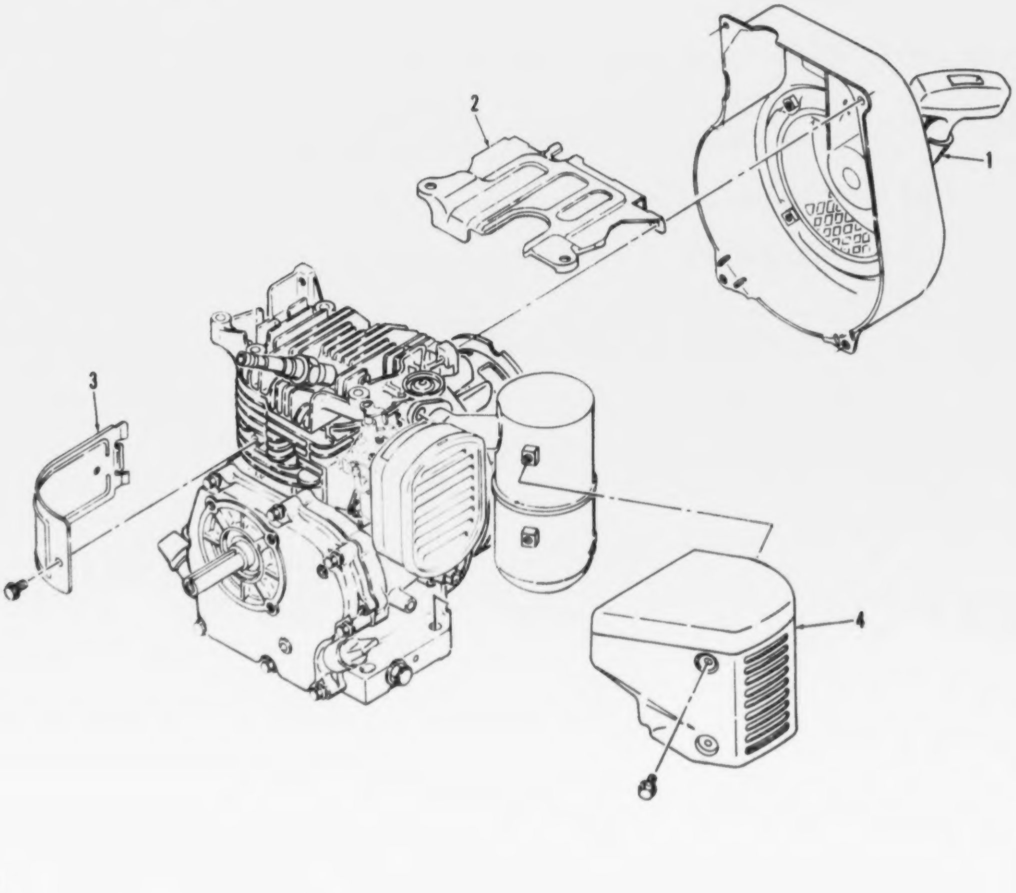
This task covers:

a. Replacement

Tools:
3/8-in. wrench or 3/8-in. socket with handle
10-mm Wrench
19-mm Wrench

Materials:
Flywheel Shroud
Cylinder Head Cover
Cylinder Baffle
Muffler Cover
Brush, Cleaning (Appendix E, item 1)
Rag, Wiping (Appendix E, item 3)
Solvent, Dry cleaning (Appendix E, item 2)

Equipment Condition:
Ignition switch pushed in (Table 2-1, 8)
Fuel tank assembly removed (para 3-22)
Right wheel removed.



a. Replacement. Replace defective parts as follows: (If a part is not defective it is not necessary to replace it.)

(1) Removal

(a) Remove four bolts securing recoil starter assembly (1) to flywheel shroud. Place recoil starter assembly to one side.

(b) Remove four bolts, two brackets, and strut securing the flywheel shroud. Pull shroud from the engine far enough to disconnect wire from coaxial filter.

(c) Remove coaxial filter and ignition switch from flywheel shroud.

(d) Remove spark plug lead from spark plug.

(e) Remove cylinder head cover (2) from engine.

(f) Remove one bolt securing cylinder baffle (3) and disengage end of baffle from cylinder.

(g) Remove three bolts securing muffler cover (4) and pull cover from muffler.

(2) Installation

(a) Obtain replacement parts as necessary.

(b) Locate muffler cover (4) on muffler and secure with three bolts.

(c) Engage cylinder baffle (3) in position on cylinder and secure with one bolt.

(d) Locate cylinder head cover (2) on top of engine. Match mounting holes in cover with holes in cylinder head.

(e) Connect spark plug lead.

(f) Install coaxial filter and ignition switch in flywheel shroud.

(g) Hold flywheel shroud close to its location on engine and connect ignition wire to coaxial filter.

(h) Secure flywheel shroud with four bolts, two brackets, and the strut.

(i) Install recoil starter (1) with four bolts.

3-24. FLYWHEEL

This task covers:

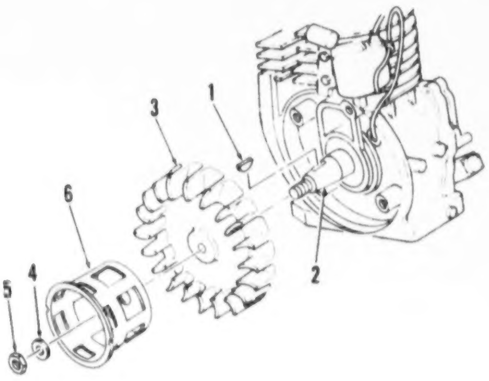
a. Inspection b. Replacement

Tools:
19-mm Socket with handle and extension
Torque Wrench
Wheel Puller

Materials: Flywheel

Equipment Condition: Ignition switch pushed in (Table 2-1, 8).
Right wheel removed.
Flywheel shroud and recoil starter removed (para 3-23).

a. Inspection. Inspect flywheel for damage that could cause it to vibrate while rotating. Excess vibration when engine is running could mean that the flywheel is out of balance.



b. Replacement.

(1) Removal

(a) Starting pulley (6), washer (4) and nut (5)

(b) Using wheel puller remove flywheel (3), extract woodruff key (1).

(2) Installation

(a) Obtain replacement flywheel (3).

(b) Insert woodruff key (1) in position on shaft (2)

(c) Place flywheel (3) on shaft with key slot lined up with key (1).

(d) Install lock washer (4), nut (5), and starting pulley (6).

(e) Torque nut (5) to 44.0 to 47.0 ft lb (59.7 to 63.7 N·m).

-25. ENGINE IGNITION COIL

This task covers:

a. Inspection b. Testing c. Replacement

Tools:
Multimeter, type TS-352 B/U
10-mm Wrench

Materials:
Brush, Cleaning (Appendix E, item 1)
Rag, Wiping (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2).
Ignition Coil

Equipment Condition:
Ignition switch pushed in (Table 2-1, 8).
Right wheel removed from handtruck.
Flywheel shroud and recoil starter removed (para 3-23).

a. Inspection

WARNING

Dry Cleaning Solvent
(Stoddard Solvent)
P-D-680

- Combustible - do not use near open flames, near welding areas, or on hot surfaces.
- Prolonged or repeated contact of skin with liquid can cause dermatitis. Repeated inhalation of vapor can irritate nose and throat and can cause dizziness.
- If any liquid contacts skin or eyes, immediately flush affected area thoroughly with water. Remove solvent-saturated clothing. If vapors cause dizziness, go to fresh air.
- When handling liquid or when applying it in an air-exhausted, partially covered tank, wear approved gloves.
- When handling liquid or when applying it at an unexhausted, uncovered tank or workbench, wear approved respirator, goggles, and gloves.

(1) Use brush, rag, and solvent to clean as necessary.

(2) Inspect for disconnected, loose, or broken wires to the ignition coil.

(3) Cable leading from ignition coil to spark plug is not wet or oil soaked.

b. Testing. Use a multimeter to check ignition coil for continuity. Resistance should be greater than 1 megohm.

c. Replacement.

(1) Removal

(a) Disconnect spark plug cable from spark plug.

(b) Remove two bolts (2), lockwashers (3) and flat washers (4), securing coil to engine.

(c) Remove coil (1).

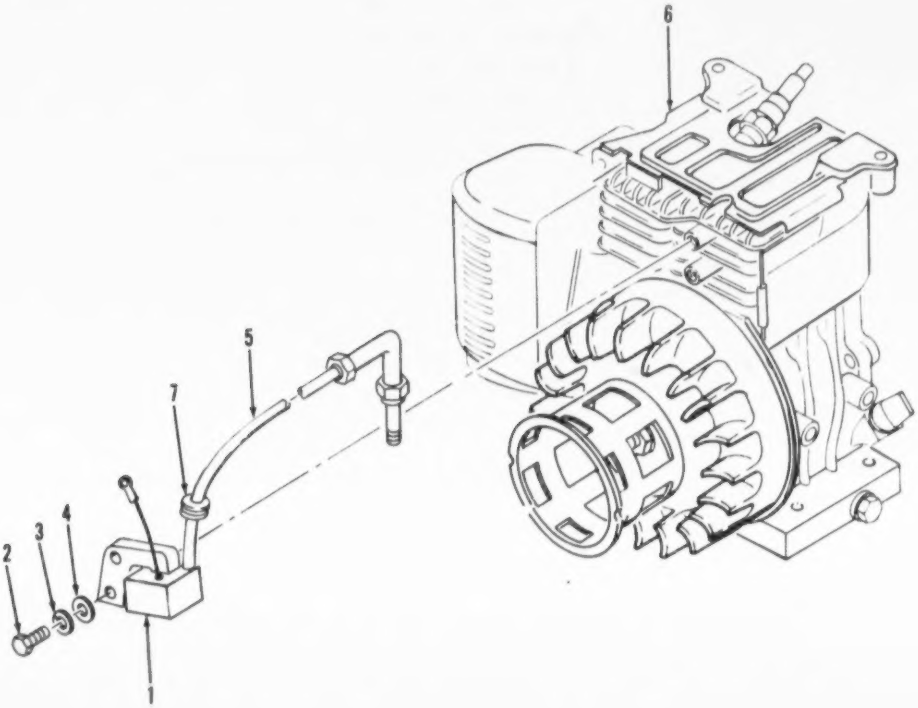
(2) Installation

(a) Obtain replacement coil (1) and place in position.

(b) Secure with two bolts (2), lockwashers (3) and flat washers (4).

(c) Route spark plug cable (5) over cylinder head cover (6) with grommet (7) in place.

(d) Connect spark plug cable (5) to spark plug (8).



3-26. IGNITION SWITCH

This task covers:

a. Inspection b. Testing c. Replacement

Tools:
Multimeter, Type TS-352 B/U
9/16-in. Wrench

Materials:
Brush, Cleaning (Appendix E, item 1)
Rag, Wiping (Appendix E, item 3)
Solvent, Dry cleaning (Appendix E, item 2)
Ignition Switch

Equipment Condition:
Ignition switch pushed in (Table 2-1, 8).
Right wheel removed from hand truck.
Flywheel shroud and recoil starter removed (para 3-23).

a. Inspection

(1) Inspect ignition switch for corrosion, obvious burn spots or other damage, and rough operation.

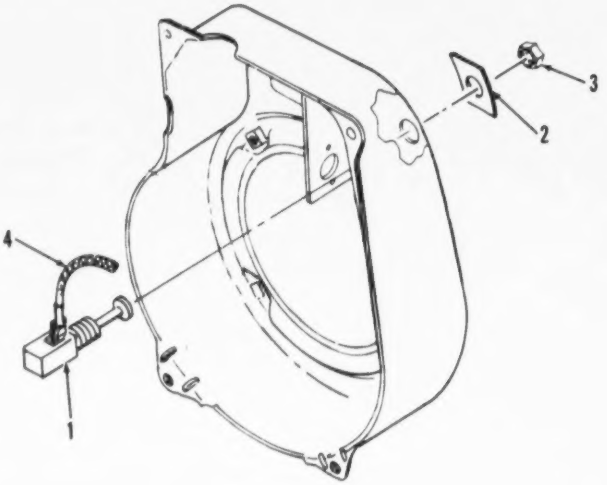
(2) Damage to the switch or rough operation indicate a defective switch.

b. Testing.

(1) Use a multimeter to test switch for continuity.

(2) Resistance between switch terminals and ground should be greater than 1 megohm

(3) If less than 1 megohm, replace ignition switch.



c. Replacement.

(1) Removal

(a) Remove ignition switch mounting nut (3) and plate (2).

(b) Disconnect cable assembly (4) from ignition switch (1).

(c) Remove ignition switch (1).

(2) Installation

(a) Obtain replacement ignition switch (1).

(b) Install ignition switch (1) with plate (2) and mounting nut (3).

(c) Connect cable assembly (4) to ignition switch.

3-27. SPARK PLUG

This task covers:

a. Inspection b. Service c. Replacement

Tools:
19-mm Wrench
20-mm Deep Socket Wrench with Handle
Gap Setting Gage

Materials:
Brush, Cleaning (Appendix E, item 1)
Rag, Wiping (Appendix E, item 3)
Solvent, Dry cleaning (Appendix E, item 2)
Spark Plug

Equipment Condition: Ignition switch pushed in (Table 2-1, 8).

a. Inspection.

WARNING

Dry Cleaning Solvent
(Stoddard Solvent)
P-D-680

- Combustible - do not use near open flames, near welding areas, or on hot surfaces.
- Prolonged or repeated contact of skin with liquid can cause dermatitis. Repeated inhalation of vapor can irritate nose and throat and can cause dizziness.
- If any liquid contacts skin or eyes, immediately flush affected area thoroughly with water. Remove solvent-saturated clothing. If vapors cause dizziness, go to fresh air.
- When handling liquid or when applying it in an air-exhausted, partially covered tank, wear approved gloves.
- When handling liquid or when applying it at an unexhausted, uncovered tank or workbench, wear approved respirator, goggles, and gloves.

(1) Clean engine as necessary using brush, rag, and solvent.

(2) Remove spark plug from engine and inspect for corroded electrodes.

(3) If electrodes are corroded discard spark plug.

b. Service. Use a gap setting gage to adjust spark plug gap to 0.024 to 0.027 inch (0.6 to 0.7 mm).

c. Replacement.

(1) Removal

(a) Remove defective spark plug.

(2) Installation

(a) Install spark plug gasket over spark plug and insert spark plug in hole in head. Torque spark plug 8.7 to 10.8 foot pounds (11.8 to 14.6 N·m).

3-28. ENGINE AIR CLEANER

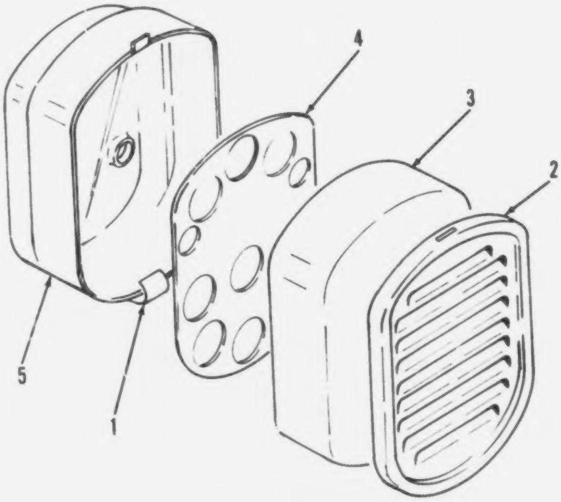
This task covers:

a. Service b. Replacement

Tools: 10-mm Wrench

Materials: Brush, Cleaning (Appendix E, item 1)
Rag, Wiping (Appendix E, item 3)
Solvent, Dry cleaning (Appendix E, item 2).
Kerosene (Appendix E, item 8)
Air Cleaner Assembly

Equipment Condition: Ignition switch pushed in (Table 2-1, 8).



a. Service.

(1) Release clip (1) and remove cover (2).

(2) Remove element (3) and retainer (4) from body (5).

(3) Remove all buildup of dirt, grease, etc., by wiping with a soft cloth (Appendix E, item 3).

(4) Wash element (3) in kerosene. Wrap in a clean cloth and squeeze dry.

(5) Saturate element with kerosene, then squeeze out the excess.

WARNING

Dry Cleaning Solvent
(Stoddard Solvent)
P-D-680

- Combustible - do not use near open flames, near welding areas, or on hot surfaces.
- Prolonged or repeated contact of skin with liquid can cause dermatitis. Repeated inhalation of vapor can irritate nose and throat and can cause dizziness.
- If any liquid contacts skin or eyes, immediately flush affected area thoroughly with water. Remove solvent-saturated clothing. If vapors cause dizziness, go to fresh air.
- When handling liquid or when applying it in an air-exhausted, partially covered tank, wear approved gloves.
- When handling liquid or when applying it at an unexhausted, uncovered tank or workbench, wear approved respirator, goggles, and gloves.

(6) Clean metal parts using a clean, soft cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1) and cleaning solvent (Appendix E, item 2).

(7) Allow metal parts to dry.

b. Replacement.

(1) Removal

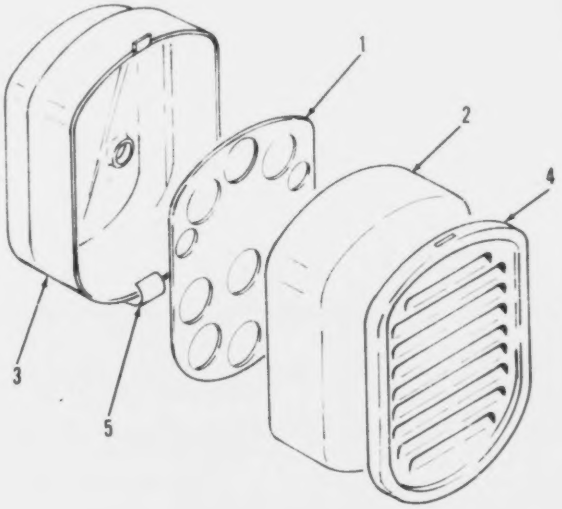
(a) With air cleaner disassembled (refer to Service) remove two nuts holding body (3) to carburetor.

(2) Installation

(a) Obtain replacement air cleaner assembly, disassemble it, and install body (3) onto carburetor.

(b) Install retainer (1) and element (2) into body (3).

(c) Install cover (4) on body and secure with clip (5).



3-29. AIR CLEANER ELEMENT

This task covers:

a. Replacement

Materials: Rag, Wiping (Appendix E, item 3)
Kerosene (Appendix E, item 8)

Equipment Condition: Ignition switch pushed in (Table 2-1, 8).
Air cleaner element removed (para 3-28).

a. Replacement

(1) Obtain replacement element.

(2) Saturate element with kerosene, then squeeze out the excess.

(3) Place element in air cleaner body.

(4) Install air cleaner cover and secure with clip.

3-30. CARBURETOR

This task covers:

a. Inspection
b. Service
c. Adjustment
d. Replacement

Tools:
10-mm Wrench
12-mm Wrench

Materials: Brush, Cleaning (Appendix E, Item 1)
Rag, Wiping (Appendix E, item 3)
Solvent, Dry cleaning (Appendix E, item 2)

Equipment Condition: Ignition switch pushed in (Table 2-1, 8).
Engine air cleaner removed (para 3-28).

a. Inspection.

WARNING

Dry Cleaning Solvent
(Stoddard Solvent)
P-D-680

- Combustible - do not use near open flames, near welding areas, or on hot surfaces.
- Prolonged or repeated contact of skin with liquid can cause dermatitis. Repeated inhalation of vapor can irritate nose and throat and can cause dizziness.
- If any liquid contacts skin or eyes, immediately flush affected area thoroughly with water. Remove solvent-saturated clothing. If vapors cause dizziness, go to fresh air.
- When handling liquid or when applying it in an air-exhausted, partially covered tank, wear approved gloves.
- When handling liquid or when applying it at an unexhausted, uncovered tank or workbench, wear approved respirator, goggles, and gloves.

(1) Clean carburetor as necessary using brush, rag, and solvent.

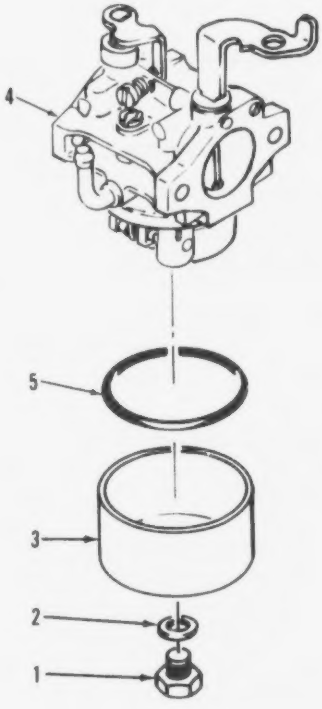
(2) Inspect carburetor for damage, and loose, or missing parts.

b. Service.

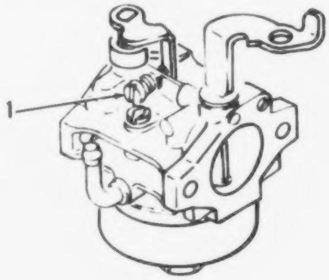
(1) Close fuel shutoff. Remove screw (1) and washer (2) holding float chamber (3) on carburetor (4). Discard gasket (5).

(2) Empty float chamber (3) and wipe it clean inside and out with a wiping rag (Appendix E, item 3).

(3) Install float chamber (3) and new gasket (5). Secure with washer (2) and screw (1).



c. Adjustment. With the engine running, rotate speed control lever stop screw (1) until the engine is idling at the most favorable speed.



d. Replacement.

(1) Removal

(a) Slide defective carburetor (6) off mounting studs. Discard carburetor flange gasket (2), insulating plate gasket (4), and air cleaner gasket (7).

WARNING

Dry Cleaning Solvent
(Stoddard Solvent)
P-D-680

- Combustible - do not use near open flames, near welding areas, or on hot surfaces.
- Prolonged or repeated contact of skin with liquid can cause dermatitis. Repeated inhalation of vapor can irritate nose and throat and can cause dizziness.
- If any liquid contacts skin or eyes, immediately flush affected area thoroughly with water. Remove solvent-saturated clothing. If vapors cause dizziness, go to fresh air.
- When handling liquid or when applying it in an air-exhausted, partially covered tank, wear approved gloves.
- When handling liquid or when applying it at an unexhausted, uncovered tank or workbench, wear approved respirator, goggles, and gloves.

(b) Clean carburetor mounting boss (1) on the crankcase as necessary with brush, rag, and solvent.

(2) Installation

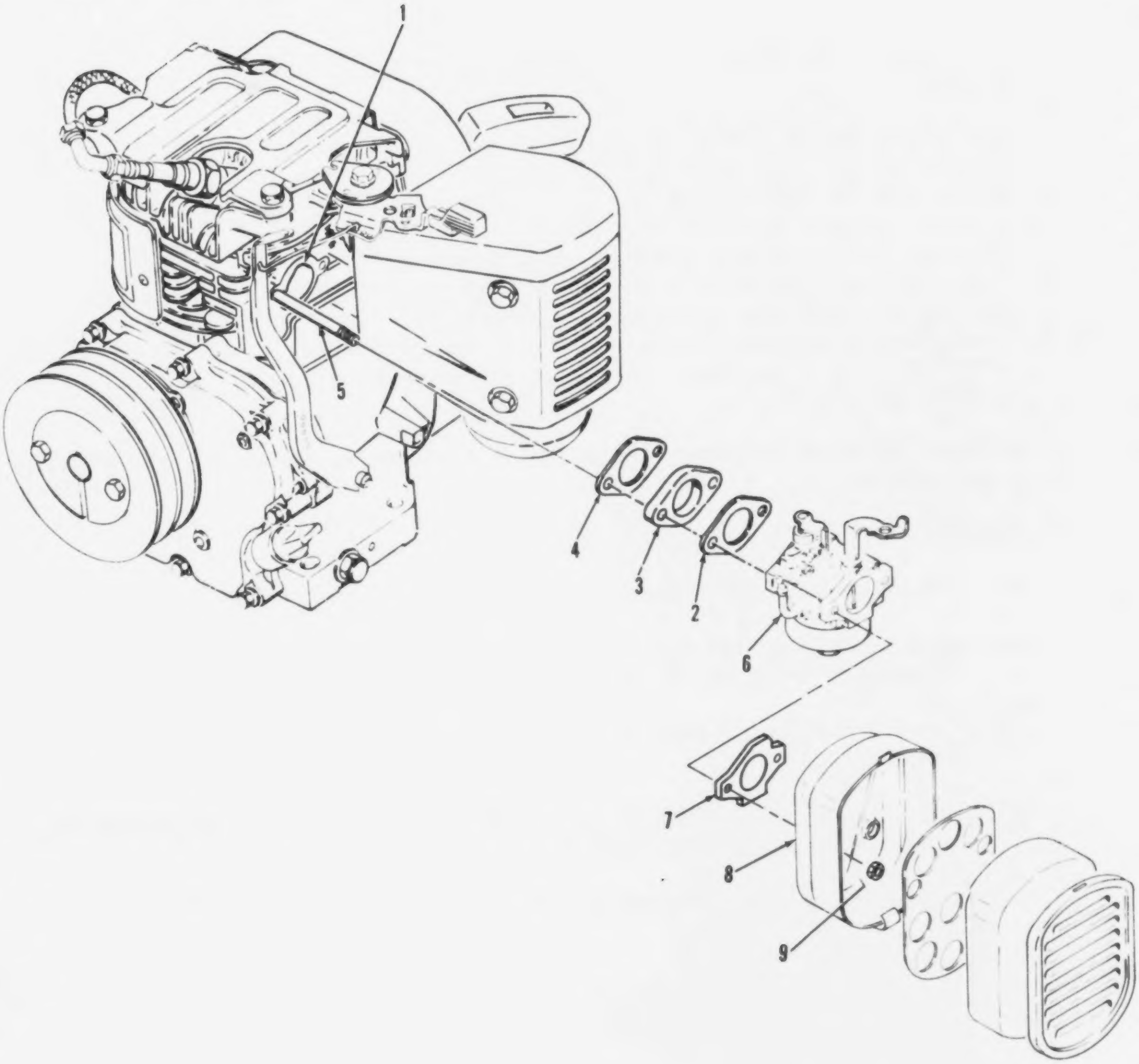
(a) Obtain replacement carburetor (6) and new gaskets (2, 4, 7).

(b) Slide insulating plate gasket (2), carburetor insulating plate (3), and carburetor flange gasket (4) onto carburetor mounting studs (5).

(c) Slide carburetor assembly (6) onto mounting studs (5) and slide air cleaner gasket (7) against it.

(d) Slide the air cleaner body (8) onto studs, with the clip down, and secure the complete installation with two nuts (9).

(e) Adjust carburetor per subparagraph c (adjustment).



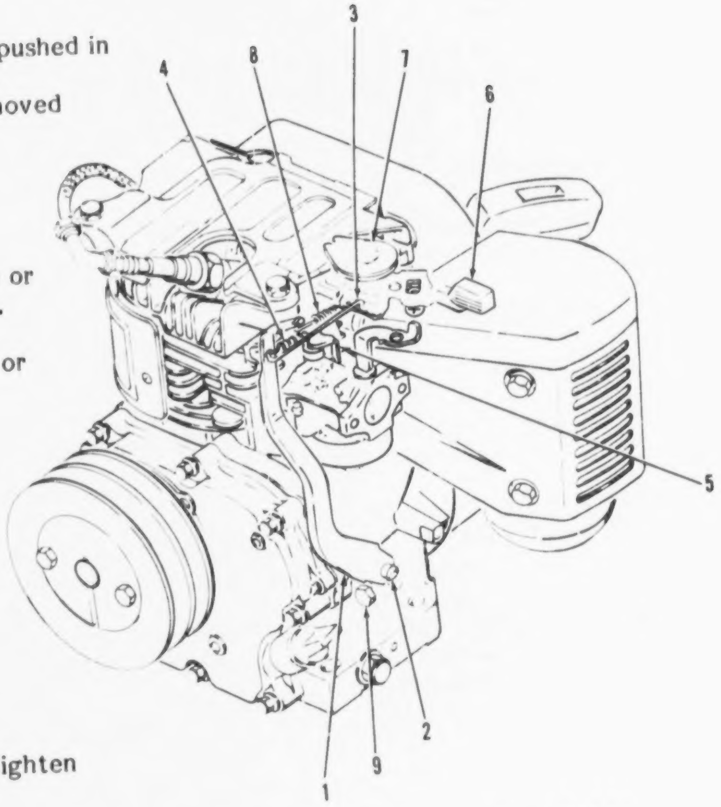
-31. GOVERNOR

This task covers:

a. Inspection b. Adjustment

Tools:
10-mm Wrench

Equipment Condition: Ignition switch pushed in (Table 2-1, 8). Air cleaner removed (para 3-28).



a. Inspection.

(1) Inspect governor mechanism outside of crankcase for loose or missing springs, bolts, or nuts.

(2) Inspect for dents, bent parts, or other damage.

b. Adjustment.

NOTE

This procedure is only necessary if governor lever was loosened or removed.

(1) Install governor lever (1) on governor shaft (2). Do not tighten clamp screw.

(2) Attach control rod (3) and spring (4) from carburetor speed control lever (5) to governor lever (1).

(3) Install control lever assembly (6) to cylinder head. Do not tighten flange screw (7).

(4) Connect governor spring (8) from control lever (6) hole No. 2 to governor lever (1).

(5) Turn control lever (6) counterclockwise until speed control lever valve is opened fully.

(6) Turn governor shaft (2) clockwise as far as it can be turned. Tighten governor lever clamp screw (9).

(7) Tighten flange screw (7) just enough so that lever can be moved and held in various speed positions.

3-32. GOVERNOR ROD ASSEMBLY

This task covers:

a. Inspection b. Adjustment c. Replacement

Equipment Condition: Ignition switch pushed in (Table 2-1, 8).

a. Inspection.

(1) Inspect governor rod (3) for unwanted bends, or missing springs (4, 8).

b. Adjustment.

(1) Install spring (8) in hole No. 2 in control lever (6).

c. Replacement

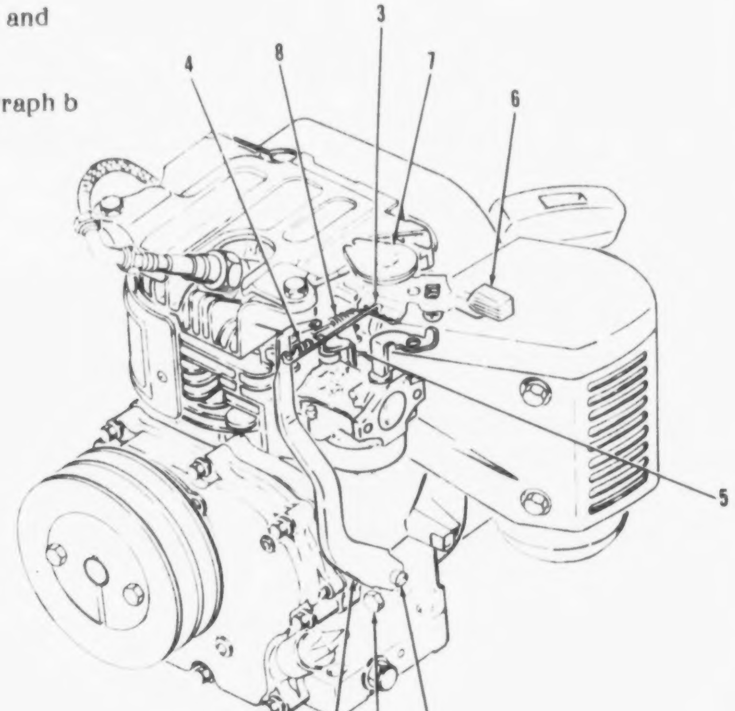
(1) Removal

(a) Remove springs (4, 8) and governor rod (3).

(2) Installation

(a) Install springs (4, 8) and governor rod (3).

(b) Adjust per subparagraph b adjustment.



3-33. GOVERNOR CONTROL ASSEMBLY

This task covers:

a. Inspection b. Adjustment c. Replacement

Tools:
10-mm Wrench
Revolution Counter

Equipment Condition: Left wheel removed.
Governor spring installed from governor lever to No. 2 hole in control lever (second hole from handle).
Belt guard and belts removed (para 3-11 and 3-12).
Ignition switch pulled out (engine running).

a. Inspection. Inspect governor control assembly for bent, broken or corroded parts.

WARNING

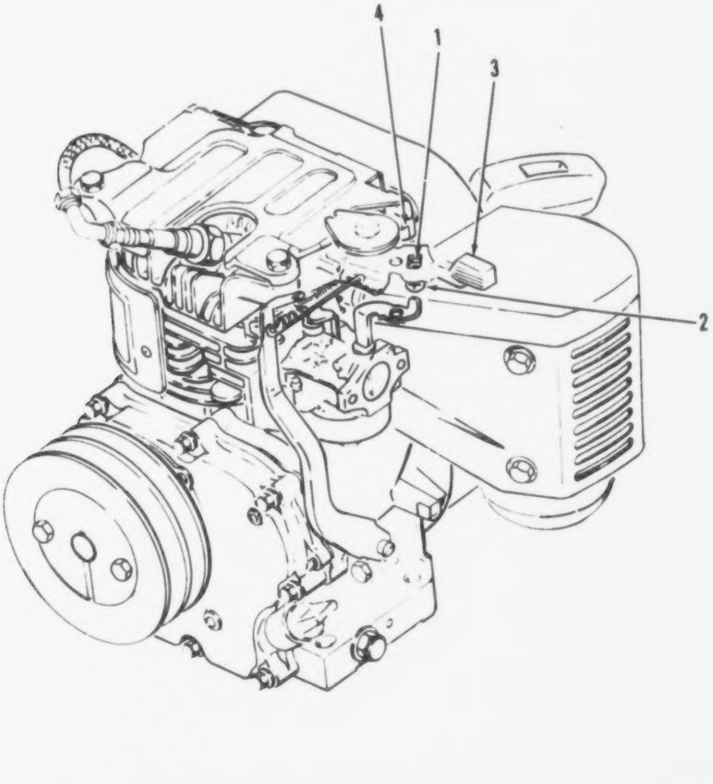
Keep fingers and hand away from rotating pulley to prevent injury to personnel.

b. Adjustment.

(1) Loosen locknut (1) on adjusting screw (2).

(2) Operate engine without load and push control lever (3) in a counterclockwise direction so that adjusting screw (2) is against stop lug (4).

(3) Place a revolution counter against the end of the crankshaft and rotate the adjusting screw (2) to obtain 2850 RPM. Tighten locknut (1).



c. Replacement.

(1) Removal

(a) Remove control mounting screw (1).

(b) Remove stop plate (2), friction washer (3), and control lever (4).

(c) Remove control lever handle (5), locknut (6), and stop screw (7).

(d) Discard defective parts and replace them.

(2) Installation

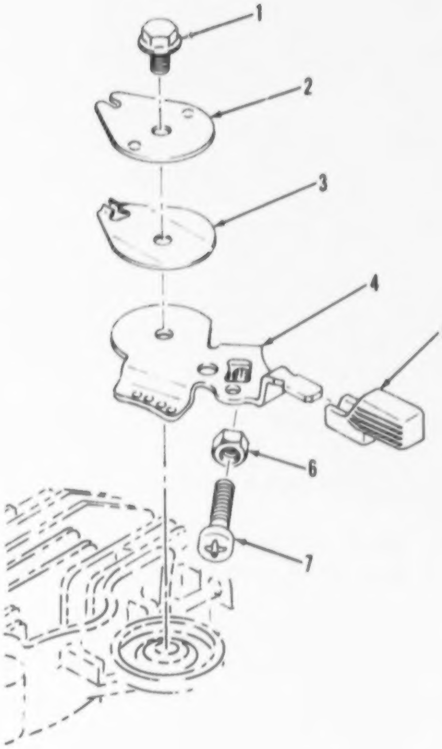
(a) Install stop screw (7), locknut (6), and handle (5) on control lever (4).

(b) Place control lever (4) on engine head over mounting hole, stack friction washer (3) and stop plate (2) on control lever.

(c) Be sure that notch in stop plate (2) engages fin on engine head.

(d) Install control mounting screw (1)

(e) Adjust governor control assembly per Adjustment.



-34. RECOIL STARTER ASSEMBLY

This task covers:

a. Inspection b. Replacement c. Repair

Tools:
19-mm Socket with handle and extension
Torque Wrench
10-mm Wrench

Materials:
Brush, Cleaning (Appendix E, item 1)
Rag, Wiping (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2)
Recoil Starter Assembly

Equipment Condition:
Ignition switch pushed in (Table 2-1, 8).
Right wheel removed.

a. Inspection.

WARNING

Dry Cleaning Solvent
(Stoddard Solvent)
P-D-680

- Combustible - do not use near open flames, near welding areas, or on hot surfaces.
- Prolonged or repeated contact of skin with liquid can cause dermatitis. Repeated inhalation of vapor can irritate nose and throat and can cause dizziness.
- If any liquid contacts skin or eyes, immediately flush affected area thoroughly with water. Remove solvent-saturated clothing. If vapors cause dizziness, go to fresh air.
- When handling liquid or when applying it in an air-exhausted, partially covered tank, wear approved gloves.
- When handling liquid or when applying it at an unexhausted, uncovered tank or workbench, wear approved respirator, goggles, and gloves.

(1) Use brush, rag, and solvent as necessary to clean recoil starter assembly and flywheel shroud.

(2) Inspect for broken or badly frayed rope.

(3) Inspect for smooth operation when rope handle is pulled and released.

(4) Inspect for damage that may interfere with recoil starter operation.

b. Replacement.

(1) Removal

(a) Remove four bolts securing recoil starter assembly (3) to flywheel shroud (4).

(b) Remove recoil starter assembly (3).

(c) Remove engine flywheel nut (2) and washer, pull starting pulley (1) from flywheel shaft.

NOTE

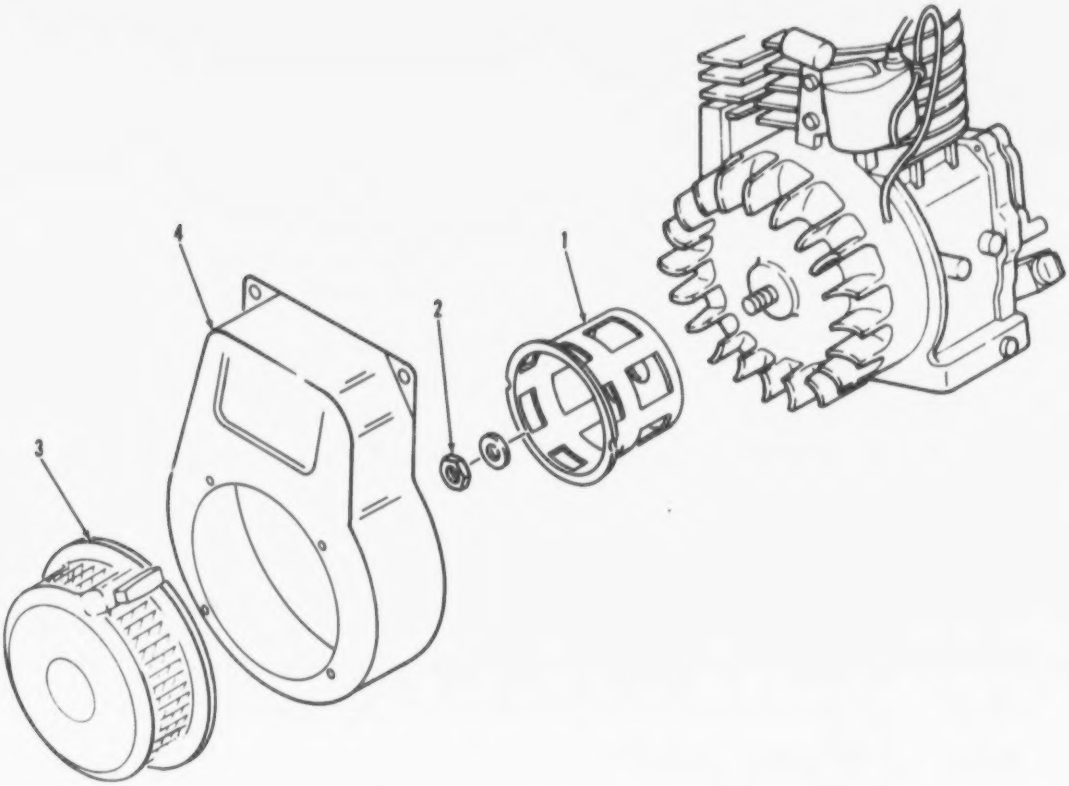
If repair of recoil starter assembly is required, proceed to next paragraph: Repair.

(2) Installation

(a) Obtain replacement recoil starter assembly (3) and starting pulley (1).

(b) Install starting pulley (1) on engine flywheel shaft and secure with washer and engine flywheel nut (2). Torque to 44.0 to 47.0 ft-lb (59.7 top 6.3 N·m).

(c) Install recoil starter assembly (3) on flywheel shroud (4). Secure with four bolts.



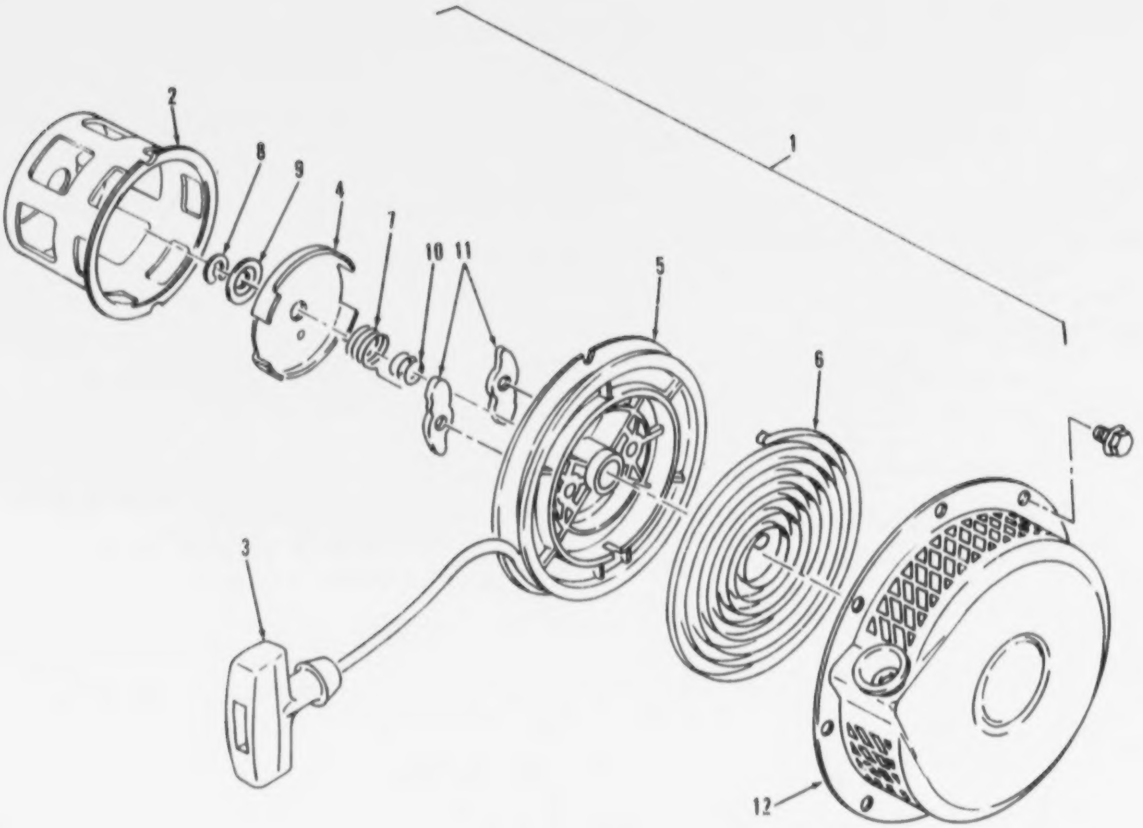


Figure 9. Recoil Starter Assembly

c. Repair.

NOTE

This procedure goes all the way through disassembly and assembly. It is only necessary to disassemble the recoil starter assembly enough to correct the fault. After the defective parts have been removed it is possible to assemble the recoil starter assembly from that point.

(1) Remove recoil starter assembly (1) from flywheel shroud. If it is not necessary to remove the starting pulley (2) from the flywheel, leave it there.

(2) Pull about 14 inches (355 mm) of rope (3) out of recoil starter assembly (1).

(3) Press thumb against ratchet retainer (4) to prevent reel (5) from unwinding.

(4) Lock rope (3) in notch on outer rim of reel (5).

(5) Release thumb pressure against ratchet retainer (4) and let power spring (6) unwind.

(6) Twist loop of return spring (7) so that it will slip through slot in ratchet retainer (4).

(7) Remove clip (8), thrust washer (9), and ratchet retainer (4). Reel (5) will completely unwind as these parts are removed.

(8) Take out compression spring (10), return spring (7), and two ratchets (11). The end of return spring (7) is hooked in a hole in the reel (5) hub.

CAUTION

Use care to ensure that power spring (6) remains in recess of housing (12) and does not pop out. Do not remove power spring (6) except for replacement.

(9) Slowly lift reel (5) from support shaft in housing (12). If power spring (6) escapes or is purposely removed, perform steps 10 through 14 to install it.

(10) Obtain a piece of 16 or 18 gauge soft iron wire approximately 15 inches (381 mm) long and twist the ends together to form a loop 3.15 inches (80 mm) inside diameter.

(11) Wind the power spring (6) inside the wire loop; start with the outer loop of the spring and wind in a counterclockwise direction.

(12) Place the power spring (6) and wire loop assembly over the recess in the reel (5).

(13) Align the hook in the outer loop of the power spring (6) over the tension tab in the reel (5).

(14) Carefully press the spring out of the wire loop and into the recess in the reel (5).

(15) Remove pieces of broken rope. Discard.

(16) Install free end (without handle) of rope assembly (3) into guide bushing of housing (12) and through hole in reel (5) groove.

(17) Pull rope (3) out through cavity opening and tie an overhand knot about 1 inch (25 mm) from end.

(18) Stuff knot into cavity opening.

(19) Spread a film of light grease on power spring (6) and support shaft.

(20) Install the reel (5) so that inner loop of power spring (6) engages the tang next to the support shaft in the housing (12).

(21) Wind rope assembly (3) 2-1/2 turns clockwise in reel (5) and lock rope in notch of reel pulley.

(22) Turn reel (5) counterclockwise until tang engages notch in power spring.

(23) Use fingers to restrain the reel (5) and keep it from popping out and unwinding.

(24) With the rope (3) hooked into the reel (5) notch, obtain spring tension by turning the reel four revolutions counterclockwise.

(25) Remove rope (3) from notch in reel (5) pulley and let reel slowly turn clockwise as rope winds onto reel and handle returns to guide bushing on housing (12).

(26) Install compression spring (10).

(27) Install return spring (7) with bent end hooked into hole of reel (5) hub and looped end toward the outside.

(28) Install ratchets (11) so they fit the contour of the recesses in the reel (5) hub (tips pointed in a counterclockwise direction).

(29) Install ratchet retainer (4) so that loop end of return spring (7) extends through slot.

(30) Rotate ratchet retainer (4) slightly clockwise until the two small slots in the retainer just begin to engage the two ratchets (11).

(31) Press down on ratchet retainer (4) and install thrust washer (9) and clip (8).

3-35. CYLINDER HEAD AND GASKET

This task covers:

Service

Materials: Brush, Cleaning (Appendix E, item 1)
Rag, Wiping (Appendix E, item 3)
Solvent, Dry cleaning (Appendix E, item 2).

Equipment Condition: Ignition switch pushed in (Table 2-1, 8).
Fuel tank drained and removed (para 3-22).
Flywheel shroud removed (para 3-23).

a. Service.

(1) Remove dirt from between cooling fins.

(2) Check cylinder head (2) for distortion. If head is warped, notify supervisor.

3-36. OIL DIPSTICK AND GASKET

This task covers:

Replacement

Materials: Brush, Cleaning (Appendix E, item 1)
Rag, Wiping (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2)
Dipstick and Gasket

Equipment Condition: Ignition switch pushed in (Table 2-1, 8).

Replacement.

WARNING

Dry Cleaning Solvent
(Stoddard Solvent)
P-D-680

- Combustible - do not use near open flames, near welding areas, or on hot surfaces.
- Prolonged or repeated contact of skin with liquid can cause dermatitis. Repeated inhalation of vapor can irritate nose and throat and can cause dizziness.
- If any liquid contacts skin or eyes, immediately flush affected area thoroughly with water. Remove solvent-saturated clothing. If vapors cause dizziness, go to fresh air.
- When handling liquid or when applying it in an air-exhausted, partially covered tank, wear approved gloves.
- When handling liquid or when applying it at an unexhausted, uncovered tank or workbench, wear approved respirator, goggles, and gloves.

(1) Use brush, rag, and solvent as necessary to clean dipstick area of engine.

(2) Remove defective dipstick and gasket. Discard.

(3) Obtain replacement dipstick with gasket.

(4) Coat dipstick gasket with a small amount of engine oil.

(5) Screw dipstick into crankcase filler hole. Torque finger-tight.

3-37. AFTERCOOLER ASSEMBLY

This task covers:

a. Inspection b. Replacement

Tools:
3/4-in. Wrench
13/16-in. Wrench
7/8-in. Wrench

Materials:
Brush, Cleaning (Appendix E, item 1)
Rag, Wiping (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2)
Tube Assembly, Aftercooler
Adapter
Elbow

Equipment Condition:
Ignition switch pushed in (Table 2-1, 8)
Pressure released from air tank (Table 2-1, 15).

a. Inspection.

WARNING

Dry Cleaning Solvent
(Stoddard Solvent)
P-D-680

- Combustible - do not use near open flames, near welding areas, or on hot surfaces.
- Prolonged or repeated contact of skin with liquid can cause dermatitis. Repeated inhalation of vapor can irritate nose and throat and can cause dizziness.
- If any liquid contacts skin or eyes, immediately flush affected area thoroughly with water. Remove solvent-saturated clothing. If vapors cause dizziness, go to fresh air.
- When handling liquid or when applying it in an air-exhausted, partially covered tank, wear approved gloves.
- When handling liquid or when applying it at an unexhausted, uncovered tank or workbench, wear approved respirator, goggles, and gloves.

(1) Use brush, rag, and solvent as necessary to clean compressor, air tank, and aftercooler tube assembly (1) for inspection.

(2) Inspect aftercooler tube assembly for dents or other damage.

(3) Inspect tube nuts, adapter (2), and elbow (3) for tightness. Tighten as necessary.

b. Replacement.

(1) Removal

(a) Loosen aftercooler tube assembly nuts, and unscrew all the way.

(b) Remove aftercooler tube assembly (1).

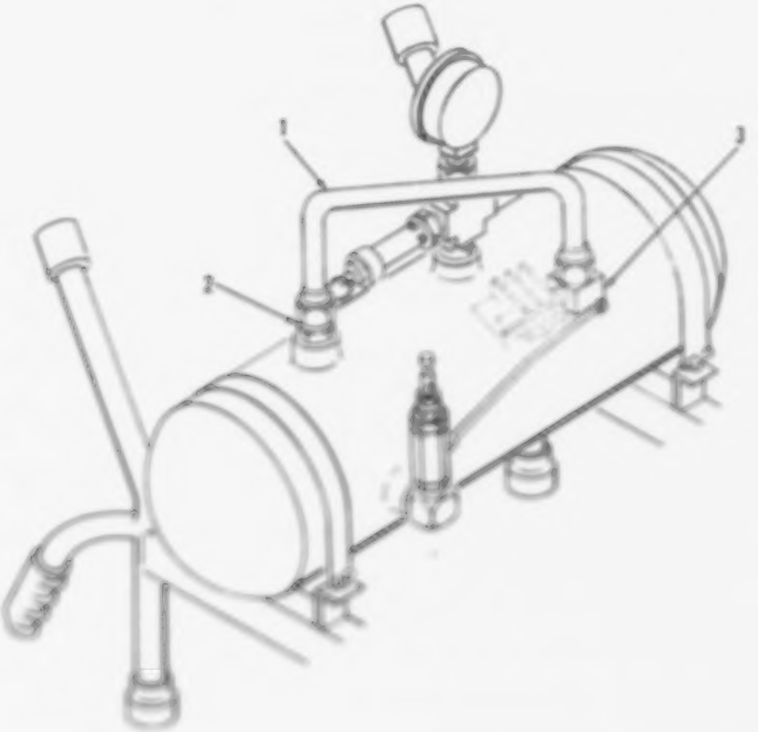
(c) If adapter (2) on air tank or elbow (3) on compressor are to be replaced, remove them.

(2) Installation

(a) If replacing adapter (2) or elbow (3) obtain replacement parts and install on air tank or compressor.

(b) Obtain replacement aftercooler tube assembly (1) and start tube nuts on adapter (2) and elbow (3).

(c) Tighten tube nuts.



3-38. SAFETY/PILOT VALVE

This task covers:

a. Inspection b. Replacement

Tools: 7/16-in. Wrench
1/2-in. Wrench
3/4-in. Wrench

Materials: Brush, Cleaning (Appendix E, item 1)
Rag, Wiping (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2)
Valve, Safety Pilot
Elbow
Adapter

Equipment Condition: Ignition switch pushed in (Table 2-1, 8).
Drain valve open (Table 2-1, 15).

a. Inspection.

WARNING

Dry Cleaning Solvent
(Stoddard Solvent)
P-D-680

- Combustible - do not use near open flames, near welding areas, or on hot surfaces.
- Prolonged or repeated contact of skin with liquid can cause dermatitis. Repeated inhalation of vapor can irritate nose and throat and can cause dizziness.
- If any liquid contacts skin or eyes, immediately flush affected area thoroughly with water. Remove solvent-saturated clothing. If vapors cause dizziness, go to fresh air.
- When handling liquid or when applying it in an air-exhausted, partially covered tank, wear approved gloves.
- When handling liquid or when applying it at an unexhausted, uncovered tank or workbench, wear approved respirator, goggles, and gloves.

(1) Use brush, rag, and solvent as necessary to clean safety valve for inspection.

(2) Inspect safety valve for loose mounting, dents, missing toggle, or other damage.

b. Replacement.

(1) Removal

(a) Disconnect second stage unloader valve tube at safety valve.

(b) Unscrew safety valve from elbow into air tank. Remove adapter from side of safety valve.

(2) Installation

(a) Obtain replacement safety valve. Install adapter.

(b) Screw safety valve into elbow in air tank.

(c) Connect tube from second stage unloader valve to adapter on safety valve.

3-39. DRAIN VALVE

This task covers:

a. Inspection b. Replacement

Tools: 9/16-in. Wrench

Materials: Brush, Cleaning (Appendix E, item 1)
Rag, Wiping (Appendix E, item 3)
Solvent, Dry cleaning (Appendix E, item 2)
Valve, Drain

Equipment Condition: Pressure in air tank.
Ignition switch pushed in (Table 2-1, 8).

a. Inspection.

WARNING

Dry Cleaning Solvent
(Stoddard Solvent)
P-D-680

- Combustible - do not use near open flames, near welding areas, or on hot surfaces.
- Prolonged or repeated contact of skin with liquid can cause dermatitis. Repeated inhalation of vapor can irritate nose and throat and can cause dizziness.
- If any liquid contacts skin or eyes, immediately flush affected area thoroughly with water. Remove solvent-saturated clothing. If vapors cause dizziness, go to fresh air.
- When handling liquid or when applying it in an air-exhausted, partly covered tank, wear approved gloves.

(2) Inspect for leaks.

(3) Inspect for dents or other damage.

b. Replacement.

(1) Open drain valve and unscrew it from bottom of air tank.

(2) Obtain replacement drain valve and screw it into bottom of air tank.

3-40. PRESSURE GAGE

This task covers:

a. Inspection b. Replacement

Tools: 9/16-in. Wrench

Materials: Brush, Cleaning (Appendix E, item 1)
Rag, Wiping (Appendix E, item 3)
Solvent, Dry cleaning (Appendix E, item 2)
Gage, Pressure

Equipment Condition: Pressure in air tank.
Ignition switch pushed in (Table 2-1, 8)

a. Inspection.

WARNING

Dry Cleaning Solvent
(Stoddard Solvent)
P-D-680

- Combustible - do not use near open flames, near welding areas, or on hot surfaces.
- Prolonged or repeated contact of skin with liquid can cause dermatitis. Repeated inhalation of vapor can irritate nose and throat and can cause dizziness.
- If any liquid contacts skin or eyes, immediately flush affected area thoroughly with water. Remove solvent-saturated clothing. If vapors cause dizziness, go to fresh air.
- When handling liquid or when applying it in an air-exhausted, partially covered tank, wear approved gloves.
- When handling liquid or when applying it at an unexhausted, uncovered tank or workbench, wear approved respirator, goggles, and gloves.

(1) Use brush, rag, and solvent as necessary to clean pressure gage for inspection.

(2) Inspect for leaks.

b. Replacement.

(1) Open drain valve to relieve pressure in air tank.

(2) Unscrew defective pressure gage.

(3) Obtain replacement pressure gage and screw it into cross fitting on top of air tank.

3-41. TANK RELIEF VALVE

This task covers:

a. Inspection b. Replacement

Tools: 3/4-in. Wrench

Materials:
Brush, Cleaning Appendix E, item 1)
Rag, Wiping (Appendix E, item 3)
Solvent, Dry cleaning (Appendix E, item 2)
Valve, Tank Relief

Equipment Condition:
Pressure in air tank.
Ignition switch pushed in (Table 2-1, 8)

a. Inspection.

WARNING

Dry Cleaning Solvent
(Stoddard Solvent)
P-D-680

- Combustible - do not use near open flames, near welding areas, or on hot surfaces.
- Prolonged or repeated contact of skin with liquid can cause dermatitis. Repeated inhalation of vapor can irritate nose and throat and can cause dizziness.
- If any liquid contacts skin or eyes, immediately flush affected area thoroughly with water. Remove solvent-saturated clothing. If vapors cause dizziness, go to fresh air.
- When handling liquid or when applying it in an air-exhausted, partially covered tank, wear approved gloves.
- When handling liquid or when applying it at an unexhausted, uncovered tank or workbench, wear approved respirator, goggles, and gloves.

(1) Use brush, rag, and solvent as necessary to clean safety valve for inspection.

(2) Inspect safety valve for loose mounting, dents, missing ring, or other damage.

(3) With pressure in the air tank, pull out the ring and release it. The hiss of escaping air

b. Replacement.

(1) Open drain valve to relieve pressure in air tank.

(2) Unscrew tank relief valve from cross fitting on top of air tank.

(3) Obtain replacement tank relief valve and screw into cross fitting on top of air tank.

3-42. AIR TANK

This task covers:

a. Inspection

Materials: Brush, Cleaning (Appendix E, item 1)
Rag, Wiping (Appendix E, item 3)
Solvent, Dry cleaning (Appendix E, item 2)

Equipment Condition: Pressure in air tank.
Ignition switch pushed in (Table 2-1, 8).

a. Inspection.

WARNING

Dry Cleaning Solvent
(Stoddard Solvent)
P-D-680

- Combustible - do not use near open flames, near welding areas, or on hot surfaces.
- Prolonged or repeated contact of skin with liquid can cause dermatitis. Repeated inhalation of vapor can irritate nose and throat and can cause dizziness.
- If any liquid contacts skin or eyes, immediately flush affected area thoroughly with water. Remove solvent-saturated clothing. If vapors cause dizziness, go to fresh air.
- When handling liquid or when applying it in an air-exhausted, partially covered tank, wear approved gloves.
- When handling liquid or when applying it at an unexhausted, uncovered tank or workbench, wear approved respirator, goggles, and gloves.

(1) Use brush, rag, and solvent as necessary to clean air tank.

(2) Inspect all fittings and welds for leaks with soapy water .

(3) Inspect for corrosion, dents, or other damage.

3-43 AIR DISCHARGE HOSE

This task covers:

a. Replacement

Tool: 5/8-in. Wrench

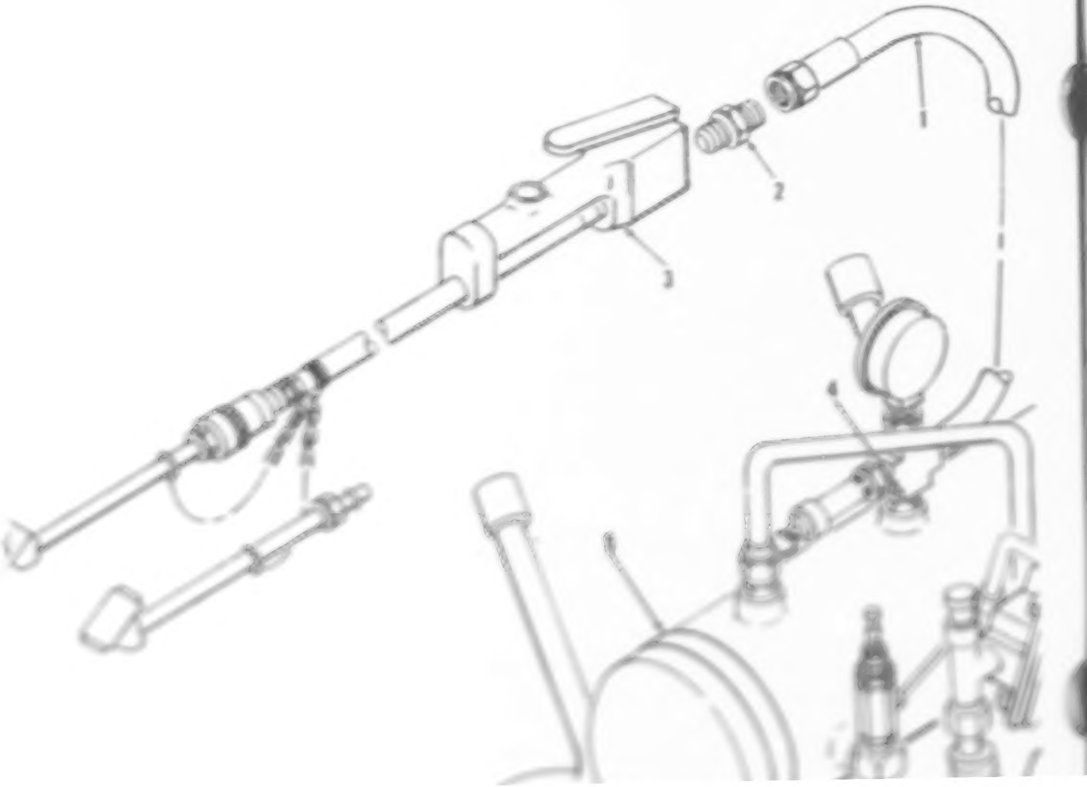
Materials: Air Discharge Hose

Equipment Condition: Ignition switch pushed in (Table 2-1, 8).
Drain valve open (Table 2-1, 15).

a. Replacement.

(1) Disconnect defective hose (1) from adapters (2) at inflator gage (3) and cross (4) on air tank (5).

(2) Obtain replacement hose (1) and connect into system at adapters (2) at inflator gage (3) and cross (4) on air tank (5).



3-44. INFLATOR GAGE

This task covers:

a. Replacement

Tools: 5/8-in. Wrench

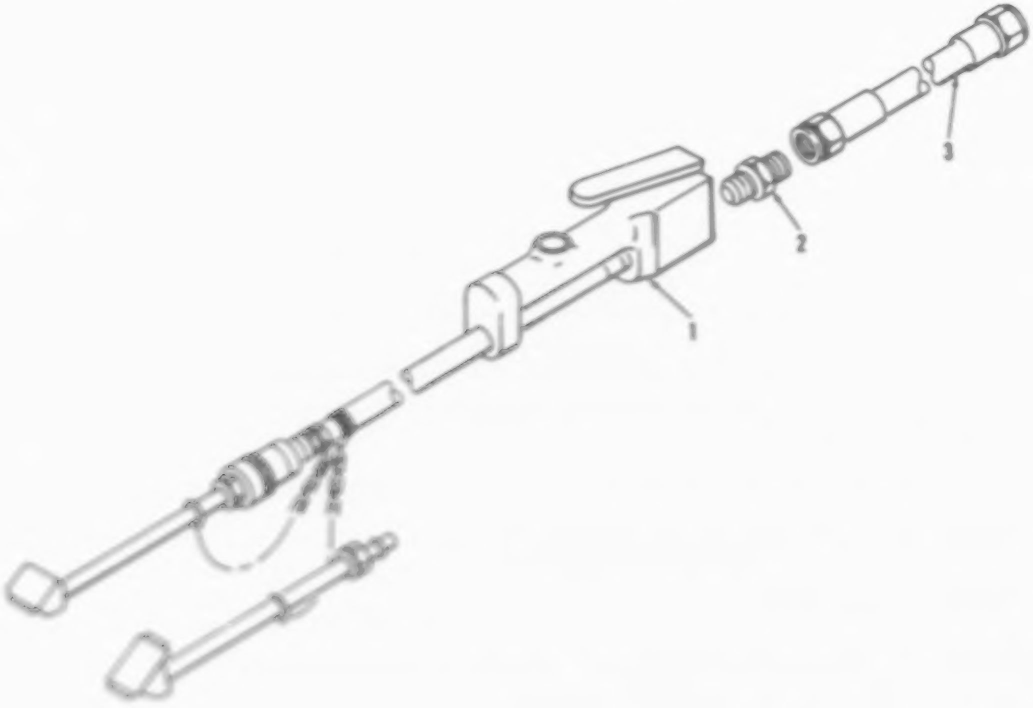
Materials: Inflator Gage

Equipment Condition: Ignition switch pushed in (Table 2-1, 8).
Drain valve open (Table 2-1, 15).

a. Replacement.

(1) Disconnect defective inflator gage (1) from adapter (2) on air discharge hose (3).

(2) Obtain replacement inflator gage (1) and install on adapter (2) at end of air discharge hose (3).



3-45. WHEELS

This task covers:

a. Inspection b. Replacement

Tools: Slip Joint Pliers

Materials:
Brush, Cleaning (Appendix E, item 1)
Rag, Wiping (Appendix E, item 3)
Solvent, Dry cleaning (Appendix E, item 2)
Grease (Appendix E, item 4)
Wheel Assembly
Cotter Pin
Flat Washer

Equipment Condition: Ignition switch pushed in (Table 2-1, 8).

a. Inspection.

WARNING

Dry Cleaning Solvent
(Stoddard Solvent)
P-D-680

- Combustible - do not use near open flames, near welding areas, or on hot surfaces.
- Prolonged or repeated contact of skin with liquid can cause dermatitis. Repeated inhalation of vapor can irritate nose and throat and can cause dizziness.
- If any liquid contacts skin or eyes, immediately flush affected area thoroughly with water. Remove solvent-saturated clothing. If vapors cause dizziness, go to fresh air.
- When handling liquid or when applying it in an air-exhausted, partially covered tank, wear approved gloves.
- When handling liquid or when applying it at an unexhausted, uncovered tank or workbench, wear approved respirator, goggles, and gloves.

(1) Use brush, rag, and solvent as necessary to clean wheels and tires.

(2) Inspect for bent rims or other damage.

(3) Inspect for corrosion.

(4) Inspect for damage or missing grease fitting (1) and bearings (2).

b. Replacement.

(1) Remove cotter pin and flat washer securing defective wheel.

(2) Remove defective wheel from axle.

(3) Clean axle and install replacement wheel, flat washer, and cotter pin.

(4) Apply grease at grease fitting on wheel.

3-46. TIRES AND TUBES

This task covers:

a. Inspection b. Service c. Repair
d. Replacement

Tools: Tire Iron
Pressure Gage

Equipment Condition: Ignition switch pushed in (Table 2-1, 8).
Wheel removed from hand truck (para 3-45).

a. Inspection.

(1) Inspect tires for proper inflation. Should be 30 psi (207 kPa).

(2) Inspect tires for cuts, punctures, imbedded stones, and severe abrasions.

b. Service.

(1) Inflate tires to 30 psi (207 kPa) as necessary.

(2) Lube wheel at grease fitting.

c. Repair. Repair is limited to replacement of defective parts.

d. Replacement. Replace defective tires and tubes.

(1) Pry the rim of the deflated tire out over hub assembly.

(2) Remove tire and tube.

(3) Obtain replacement tire and/or tube and install on hub. Be certain valve stem extends in the right direction and through hole in hub.

(4) Inflate tire to 30 psi (207 kPa).

best copy available

Section VII. PREPARATION FOR STORAGE OR SHIPMENT

3-47. GENERAL

This section provides instructions for preparation of the compressor assembly for storage or shipment.

3-48. ADMINISTRATIVE STORAGE

Prepare the compressor assembly for storage according to instructions provided in TM 740-90-1.

3-49. PACKING AND SHIPPING

a. Drain fuel tank into a suitable container.

b. Drain oil from compressor and engine crankcases.

c. Fill engine crankcase with preserving oil (Appendix E, item 6). Fill compressor crankcase with oil (Appendix E, item 5).

d. Use shipping plugs, closures, or sealing tape to cover all openings in the compressor assembly.

e. Attach to compressor all forms, tags, and records applicable to the units.

CHAPTER 4

INTERMEDIATE DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

SECTION I. TROUBLESHOOTING

4-1. GENERAL.

a. The table in this section lists the common malfunctions which you may find during the operation or maintenance of the air compressor or its components. You should perform the test/inspection and corrective maintenance in the order listed.

b. This manual cannot list all malfunctions that may occur, nor all test or inspections and corrective actions. If a malfunction is not listed or it is not corrected by the listed corrective action, notify your supervisor.

Table 4-1. Intermediate Direct Support Maintenance Troubleshooting.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

---

1. SEVERE VIBRATION.

Disassemble and inspect crankshaft and bearing.

Replace defective crankshaft or bearings.

2. ABNORMAL NOISE.

Step 1. Check for loose valve assembly. Repeat for other two cylinders.

If valve is loose, tighten valve push cover (5). Install new head gasket (4), head (3), eight washers (2), and four bolts (1). Tighten all four bolts (1) securely. Reconnect piping.

Step 2. Check for signs of piston striking head.

If piston was striking head, install two new gaskets(1), head (2), and four bolts (3). Tighten all four bolts securely. Reconnect piping.

If the above corrective actions do not correct the malfunction, notify your supervisor.

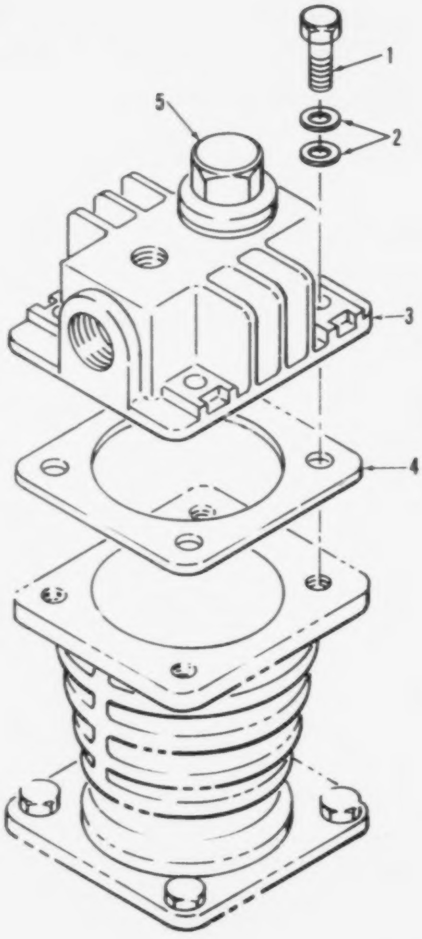


Table 4-1. Intermediate Direct Support Maintenance Troubleshooting (Continued)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

---

3. LITTLE OR NO AIR PRESSURE BUILDUP.

Step 1. Check cylinders, pistons, and rings for damage.

If valve is loose, tighten valve push cover (5). Install new head gasket (4), head (3), four bolts (1), and eight washers (2). Tighten all four bolts securely. Reconnect piping.

If valve assembly is dirty, clean valve assembly. Install new head gasket (4), head (3), four bolts (1), and eight washers (2). Tighten all four bolts (1) securely. Reconnect piping.

If head gasket is defective, replace head gasket. Install new head gasket (4), head (3), four bolts (1), and eight washers (2). Tighten all four bolts (1) securely. Reconnect piping.

If the above steps do not correct the malfunction, notify your supervisor.

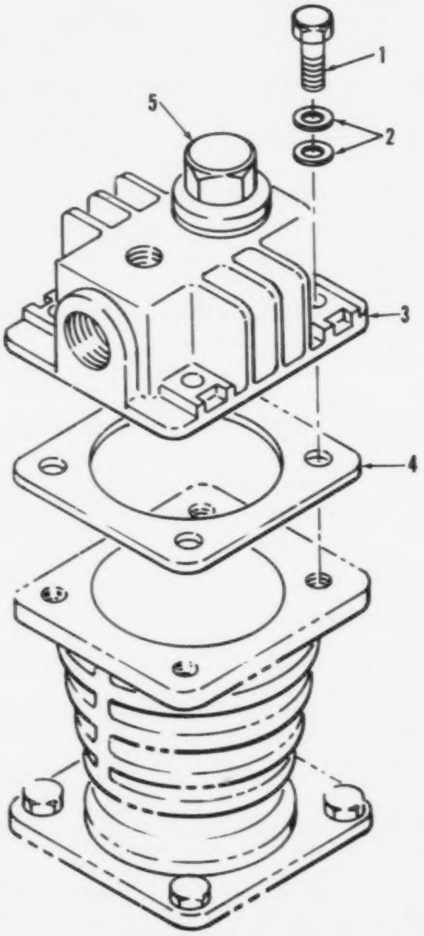


Table 4-1. Intermediate Direct Support Maintenance Troubleshooting (Continued)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

---

4. ENGINE DIFFICULT TO START.

Step 1. Fuel tank empty or fuel cock closed.

Fill fuel tank and/or open fuel cock.

Step 2. Incorrect choke setting, especially if engine is cold.

Adjust choke.

Step 3. Carburetor flooded by too much choking, especially if engine is hot.

Adjust choke.

Step 4. Loss of compression due to dry cylinder.

Restore compression. Remove spark plug. Pour approximately one ounce of engine oil into cylinder and crank engine a few times to distribute oil. Replace spark plug.

Step 5. Loose or broken spark plug.

Tighten or replace spark plug.

Step 6. Damaged cylinder head gasket or loose cylinder head.

Replace damaged gasket, and/or tighten cylinder head.

Step 7. Broken ignition wire causing short circuits.

Replace broken ignition wires.

Step 8. Defective ignition coil.

Replace defective ignition coil.

Table 4-1. Intermediate Direct Support Maintenance Troubleshooting (Continued)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

---

5. ENGINE STOPS.

Step 1. Fuel tank empty. Water, dirt or gum in gasoline.

Fill fuel tank or clean fuel tank.

Step 2. Gasoline vaporized in fuel lines due to excessive heat around engine (vapor lock).

Correct any engine shrouding problems (missing or loose shrouds).

6. ENGINE OVERHEATS.

Step 1. Oil level low.

Refill crankcase immediately.

Step 2. Ignition timing off.

Correct timing.

Step 3. Restricted air circulation or shroud removed.

Inspect air passages and clear obstructions.
Replace shroud.

Step 4. Restricted exhaust.

Clear exhaust obstruction.

Section II. Maintenance Procedures.

4-2. This section contains those maintenance procedures that are the responsibility of Intermediate Direct Support Maintenance.

4-3. COMPRESSOR ASSEMBLY

This task covers:

a. Repair

Tools:
3/8-in. Wrench
1/2-in. Wrench
5/8-in. Wrench
11/16-in. Wrench
3/4-in. Wrench
15/16-in. Wrench
13-mm Wrench
21-mm Wrench
23-mm Wrench

Materials:
Brush, Cleaning (Appendix E, item 1)
Rag, Wiping (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2)

Equipment Condition:
Ignition switch pushed in (Table 2-1, 8).
Compressor removed from hand truck (para 3-14).

Repair. Compressor repair is limited to replacing defective parts.

4-4. COMPRESSOR CYLINDER HEADS AND VALVES

This task covers:

a. Inspection b. Replacement c. Repair

Tools: 13-mm Wrench
21-mm Wrench
11/16-in. Wrench
Pliers, Snap-ring

Materials: Head Gasket (3 each)
First Stage Outlet Valve Packing (2 each)
Second Stage Outlet Valve Packing
Brush, Cleaning (Appendix E, item 1)
Rag, Wiping (Appendix E, item 3)
Solvent, Dry cleaning (Appendix E, item 2).

Equipment Condition: Compressor removed from handtruck and placed on work bench (para 3-14).
Tubes removed from compressor (para 3-15).

a. Inspection.

WARNING

Dry Cleaning Solvent
(Stoddard Solvent)
P-D-680

- Combustible - do not use near open flames, near welding areas, or on hot surfaces.
- Prolonged or repeated contact of skin with liquid can cause dermatitis. Repeated inhalation of vapor can irritate nose and throat and can cause dizziness.
- If any liquid contacts skin or eyes, immediately flush affected area thoroughly with water. Remove solvent-saturated clothing. If vapors cause dizziness, go to fresh air.
- When handling liquid or when applying it in an air-exhausted, partially covered tank, wear approved gloves.
- When handling liquid or when applying it at an unexhausted, uncovered tank or workbench, wear approved respirator, goggles, and gloves.

(1) Use brush, rag, and solvent as necessary to inspect cylinder heads and valves.

(2) Inspect for loose or missing mounting bolts and damage to cylinder heads.

b. Replacement.

NOTE

The upper first stage cylinder head has the belt guard bracket and strut secured by special length head bolts.

(1) Removal

(a) Remove four bolts (1). If removing the upper first stage cylinder head, remove the belt guard bracket and strut.

(b) Remove head (2) and gasket (3). Discard gasket.

(c) Remove outlet valve push cover (4), packing (5), spring (6) and plate (7) from head (8). Discard packing (5).

(d) Remove snap ring (9), valve receiver (10), spring (11), and valve plate (12) from head (8).

(2) Installation

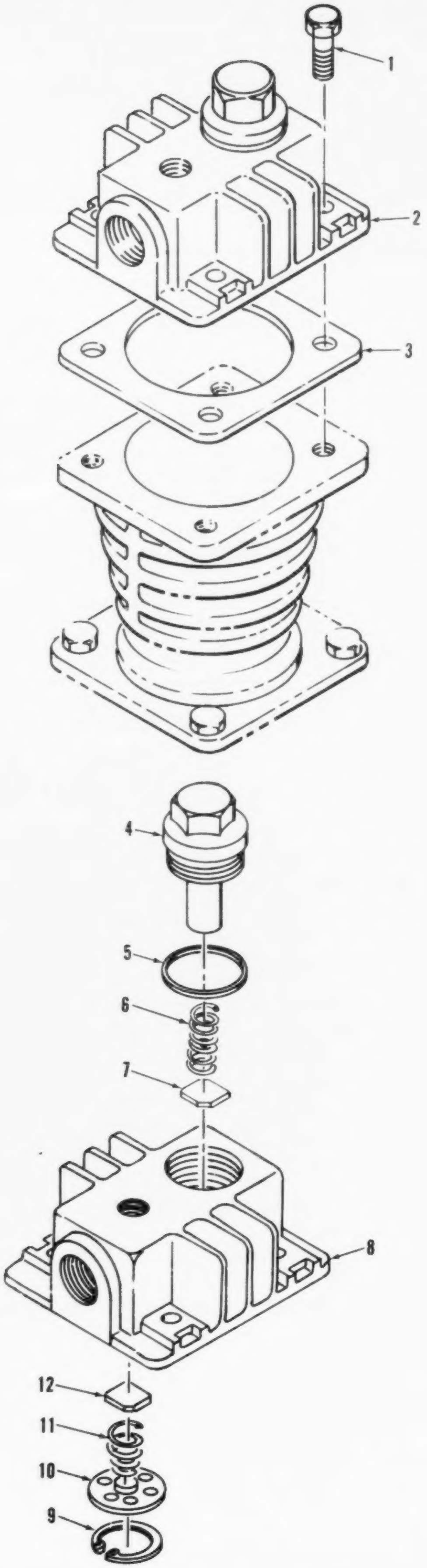
(a) Obtain replacement parts and install valve plate (12), spring (11), valve receiver (10), and snap ring (9) to head (8).

(b) Obtain replacement parts and install valve plate (7), spring (6), new packing (5), and push cover (4).

(c) Install new head gasket (3) and head (2).

NOTE

The upper first stage cylinder head has belt guard bracket and strut secured by special length head bolts.



(d) Install four bolts (1). If installing upper first stage cylinder head install the belt guard bracket and strut.

c. Repair. Repair of cylinder heads and valves is limited to replacement of defective parts.

4-5. COMPRESSOR PISTONS, CONNECTING RODS, AND CYLINDERS

This task covers:

a. Inspection b. Replacement c. Repair

Tools:
10-mm socket wrench, handle and extension
13-mm wrench
Pliers, Snap-Ring
Arbor Press
Piston Ring Compressor

Materials:
Cylinder Gasket (3 each)
First Stage Compression Ring Set (2 each)
First Stage Oil Ring (2 each)
Second Stage Compression Ring Set
Second Stage Oil Ring
Brush, Cleaning (Appendix E, item 1)
Rag, Wiping (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, Item 2)

Equipment Conditions:
Compressor removed from handtruck and placed on work bench (para 3-14).
Cylinder heads removed (para 4-4).
Crankcase drained (para 3-2).

a. Inspection.

WARNING

Dry Cleaning Solvent
(Stoddard Solvent)
P-D-680

- Combustible - do not use near open flames, near welding areas, or on hot surfaces.
- Prolonged or repeated contact of skin with liquid can cause dermatitis. Repeated inhalation of vapor can irritate nose and throat and can cause dizziness.
- If any liquid contacts skin or eyes, immediately flush affected area thoroughly with water. Remove solvent-saturated clothing. If vapors cause dizziness, go to fresh air.
- When handling liquid or when applying it in an air-exhausted, partially covered tank, wear approved gloves.
- When handling liquid or when applying it at an unexhausted, uncovered tank or workbench, wear approved respirator, goggles, and gloves.

(1) Use brush, rag, and solvent to clean cylinders, pistons, and con rods as necessary to inspect for damage.

(2) Inspect for loose mounting bolts or damage to equipment.

b. Replacement.

(1) Removal

(a) Remove four bolts (1), eight copper washers (2), first stage cylinder (3), and gasket (4). Discard gasket. Repeat for other first stage cylinder.

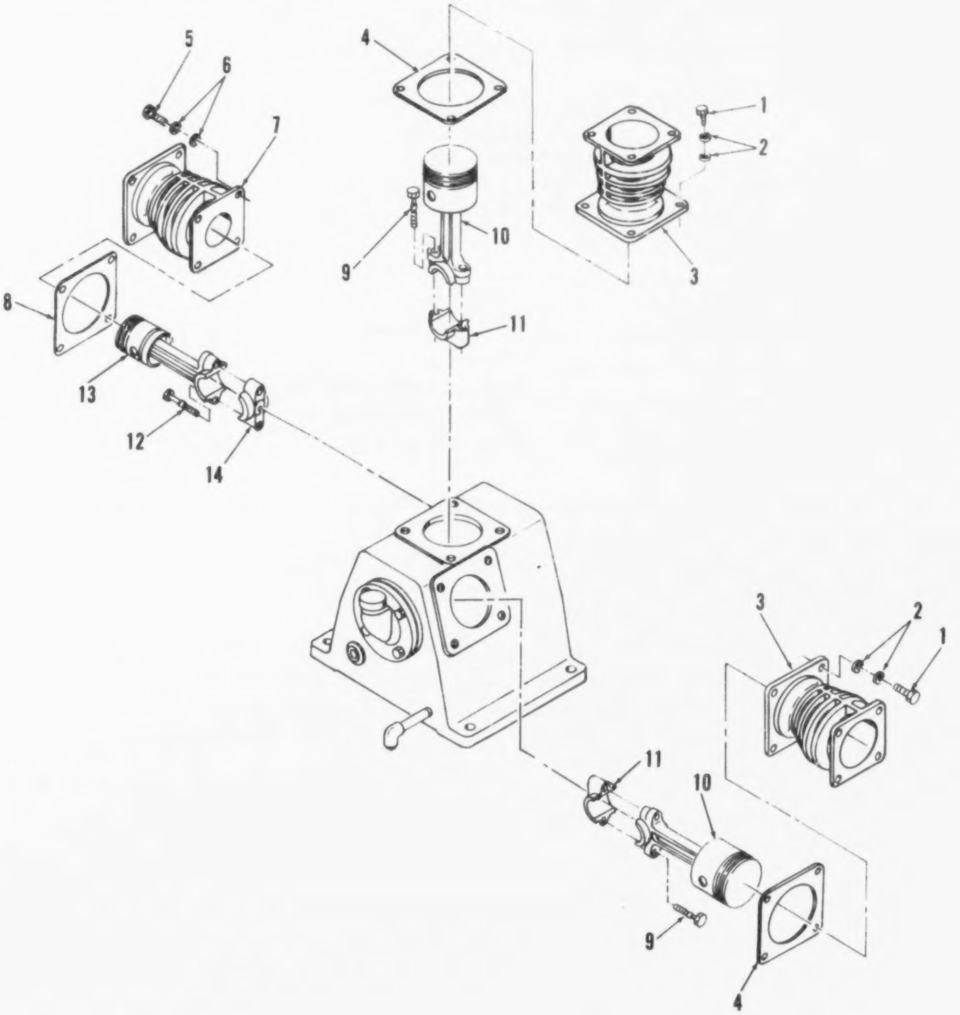
(b) Remove four bolts (5), eight copper washers (6), second stage cylinder (7), and gasket (8). Discard gasket.

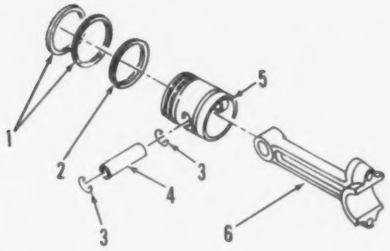
(c) Remove two bolts (9), first stage connecting rod and piston assembly (10), and connecting rod cap (11). Repeat for other first stage piston.

NOTE

Mark connecting rod caps so they may be installed on the same rod, the same way.

(d) Remove two bolts (12), second stage connecting rod and piston assembly (13), and connecting rod cap (14).





(e) Repair of the piston and connecting rod assemblies is as follows.

1) Carefully remove both compression rings (1) and the oil ring (2). Discard the rings.

2) Remove both snap rings (3) and using an arbor press, press out the piston pin (4).

3) Separate the piston (5) from the connecting rod (6).

4) Obtain replacement parts.

5) Place piston (5) into position on connecting rod (6) and install piston pin (4) into position using an arbor press.

6) Install two snap rings (3).

7) Carefully install a new oil ring (2).

8) Carefully install two new compression rings (1).

(2) Installation

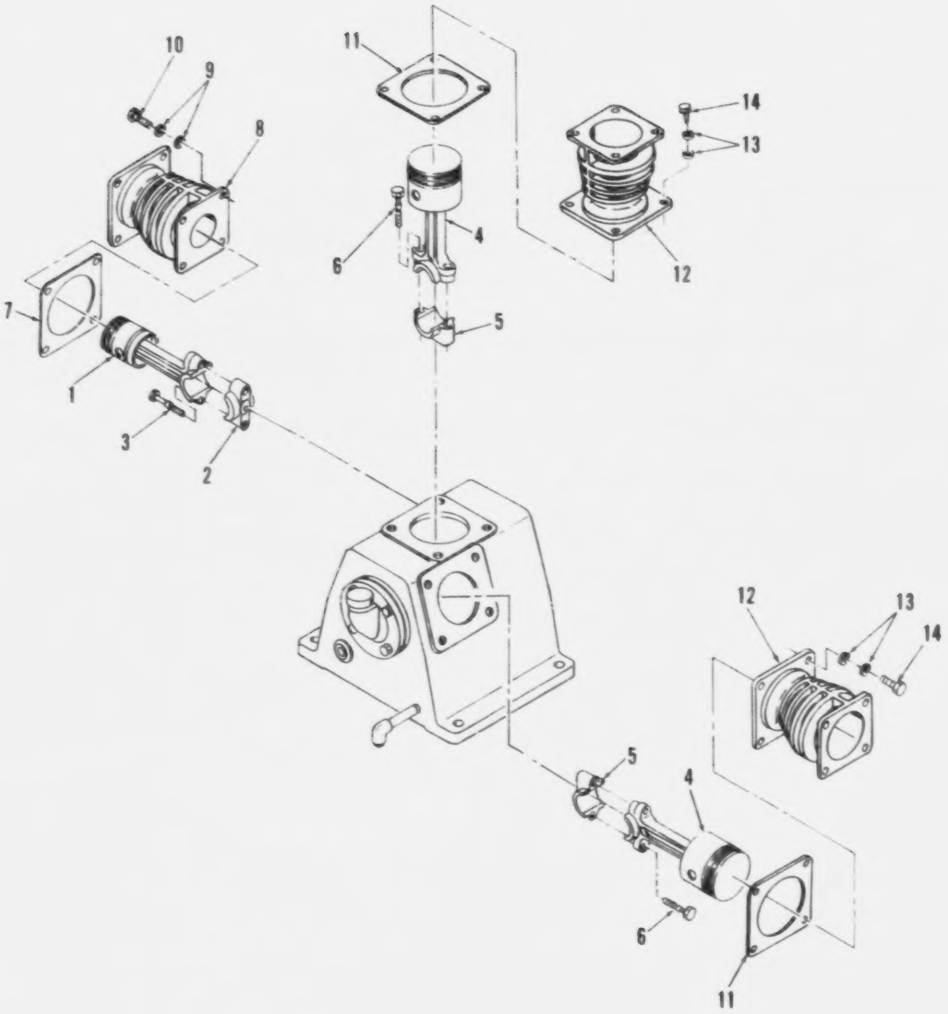
(a) Install second stage connecting rod and piston assembly (1), connecting rod cap (2), and secure with two bolts (3). Be sure that cap is installed in the original position.

(b) Install first stage connecting rod and piston assembly (4), connecting rod cap (5), and secure with two bolts (6). Be sure that cap is installed in the original position. Repeat for other first stage connecting rod and piston assembly.

(c) Install new gasket (7) into position.

(d) Carefully install cylinder (8) over connecting rod and piston assembly. Secure with eight copper washers (9) and four bolts (10).

(e) Install gasket (11) into position.


10
11
9
14
8
13
4
6
12
7
5
1
3
2
12
13
14
5
4
6
11

(f) Carefully install cylinder (12) over connecting rod and piston assembly. Secure with eight copper washers (13) and four bolts (14). Repeat for other first stage cylinder.

c. Repair. Repair of pistons, connecting rods, and cylinders is limited to replacement of defective parts.

4-6. COMPRESSOR CRANKSHAFT, BEARINGS, OIL SEALS, AND CRANKCASE

This task covers:

a. Inspection b. Replacement c. Repair

Tools:
13-mm Wrench
Slip-Joint Pliers
Small Pipe Wrench

Materials:
Rear Bearing Cover Packing
Front Bearing Cover Packing
Front Oil Seal
Oil Sight Gage Seal
Brush, Cleaning (Appendix E, item 1)
Rag, Wiping (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2)

Equipment Conditions:
Compressor removed from handtruck and placed on work bench (para 3-14).
Cylinder heads, cylinders, pistons and connecting rods removed (para 4-4 and 4-5).
Crankcase drained (para 3-2).
Flywheel removed (para 3-19).

a. Inspection.

WARNING

Dry Cleaning Solvent
(Stoddard Solvent)
P-D-680

- Combustible - do not use near open flames, near welding areas, or on hot surfaces.
- Prolonged or repeated contact of skin with liquid can cause dermatitis. Repeated inhalation of vapor can irritate nose and throat and can cause dizziness.
- If any liquid contacts skin or eyes, immediately flush affected area thoroughly with water. Remove solvent-saturated clothing. If vapors cause dizziness, go to fresh air.
- When handling liquid or when applying it in an air-exhausted, partially covered tank, wear approved gloves.
- When handling liquid or when applying it at an unexhausted, uncovered tank or workbench, wear approved respirator, goggles, and gloves.

(1) Use brush, rag, and solvent to clean crankshaft and crankcase as necessary to inspect for damage.

(2) Inspect for loose mounting bolts or damage to equipment.

b. Replacement.

(1) Removal

(a) Remove four bolts (1), four washers (2), front bearing cover (3), and front bearing gasket (4). Discard gasket.

(b) Remove crankshaft (5).

(c) Remove bearing (6) and bearing seal (7).

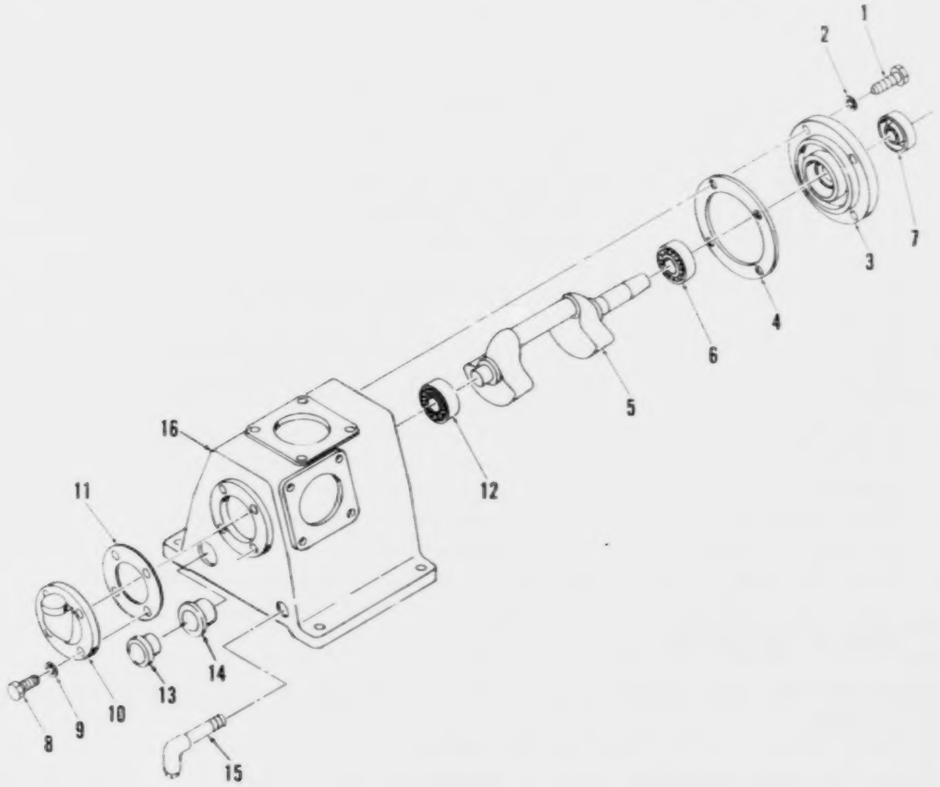
(d) Remove four bolts (8), four washers (9), rear bearing cover (10), and gasket (11). Discard gasket.

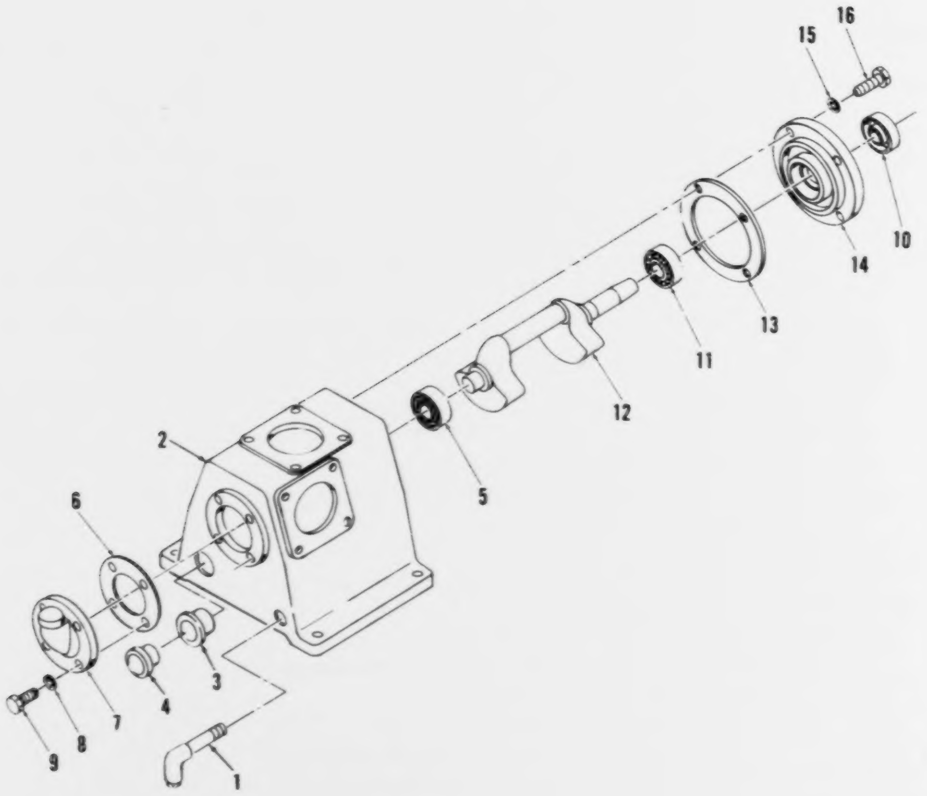
(e) Remove bearing (12).

(f) Remove oil sight gage (13) and oil sight gage seal (14).

(g) Remove oil drain plug (15) from crankcase (16).

(h) Remove all buildup of dirt, grease, etc., by wiping with a clean rag (Appendix E, item 3).





(2) Installation

(a) Obtain replacement parts as required.

(b) Install oil drain plug (1) to crankcase (2).

(c) Install oil sight gage seal (3) and oil sight gage (4).

(d) Install bearing (5).

(e) Install new gasket (6), rear bearing cover (7), four copper washers (8), and four bolts (9).

(f) Install new bearing seal (10) and bearing (11).

(g) Install crankshaft (12).

(h) Install new gasket (13), front bearing cover (14), four washers (15), and four bolts (16).

c. Repair. Repair of crankshaft, bearings, oil seals, and crankcase is limited to replacement of defective parts.

4-7. ENGINE ASSEMBLY

This task covers:

a. Repair

Materials: Brush, Cleaning (Appendix E, item 1)
Rag, Wiping (Appendix E, item 3)
Solvent, Dry Cleaning (Appendix E, item 2)

Equipment Condition: Engine removed from handtruck and placed on work bench (para 3-21).

Repair

WARNING

Dry Cleaning Solvent
(Stoddard Solvent)
P-D-680

- Combustible - do not use near open flames, near welding areas, or on hot surfaces.
- Prolonged or repeated contact of skin with liquid can cause dermatitis. Repeated inhalation of vapor can irritate nose and throat and can cause dizziness.
- If any liquid contacts skin or eyes, immediately flush affected area thoroughly with water. Remove solvent-saturated clothing. If vapors cause dizziness, go to fresh air.
- When handling liquid or when applying it in an air-exhausted, partially covered tank, wear approved gloves.
- When handling liquid or when applying it at an unexhausted, uncovered tank or workbench, wear approved respirator, goggles, and gloves.

(1) Use brush, rag, and solvent as necessary to clean engine assembly so that required repair work can be performed.

(2) Repair of engine assembly is limited to replacement of defective parts. Refer to paragraphs 3-21 through 3-35 for specific parts to be replaced.

4-8. ENGINE GOVERNOR AND CONTROL ASSEMBLY

This task covers:

a. Replacement

Tools: 10-mm Wrench

Materials: Governor Lever
Clamp Screw and Nut
Governor Spring and Rod Set

Equipment Condition: Engine removed from handtruck (para 3-21).

a. Replacement.

(1) Removal

(a) Remove governor spring and rod set consisting of: governor rod spring (1), governor spring (2), and governor rod (3).

(b) Remove clamp screw (4) and nut (5).

(c) Slide governor lever (6) from governor shaft (7).

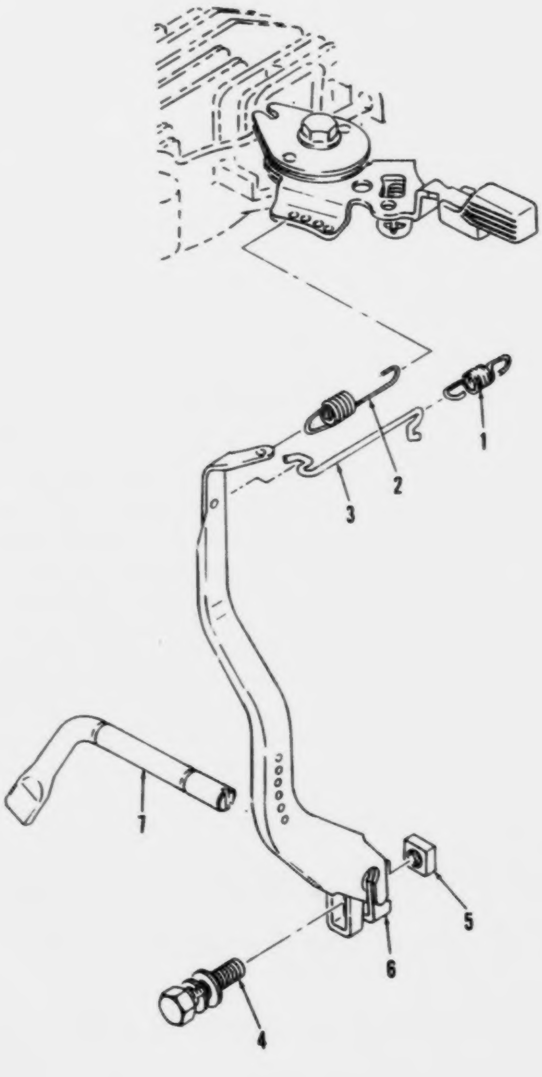
(2) Installation

(a) Obtain replacement parts.

(b) Install governor lever (6) on governor shaft (7); do not tighten clamp screw (4) and nut (5).

(c) Install governor rod (3), governor spring (2), and governor rod spring (1).

(d) Adjust governor and control assembly per Chapter 3, paragraph 3-31.



4-9. AIR TANK

This task covers:

a. Replacement

Tools: 7/16-in. Wrench

Materials:
Brush, Cleaning (Appendix E, item 1)
Rag, Wiping (Appendix E, item 3)
Solvent, Dry cleaning (Appendix E, item 2).
Air Tank Strap Assemblies.

Equipment Condition: Ignition switch pushed in (Table 2-1, 8).
All parts removed from air tank: Inflator gage, hose, pressure gage, tank relief valve, pilot valve, drain valve, aftercooler assembly, and all fittings for attachment.

a. Replacement.

(1) Remove two nuts (1), and two washers (2) securing strap assemblies (3).

(2) Remove air tank (4) from handtruck.

WARNING

Dry Cleaning Solvent
(Stoddard Solvent)
P-D-680

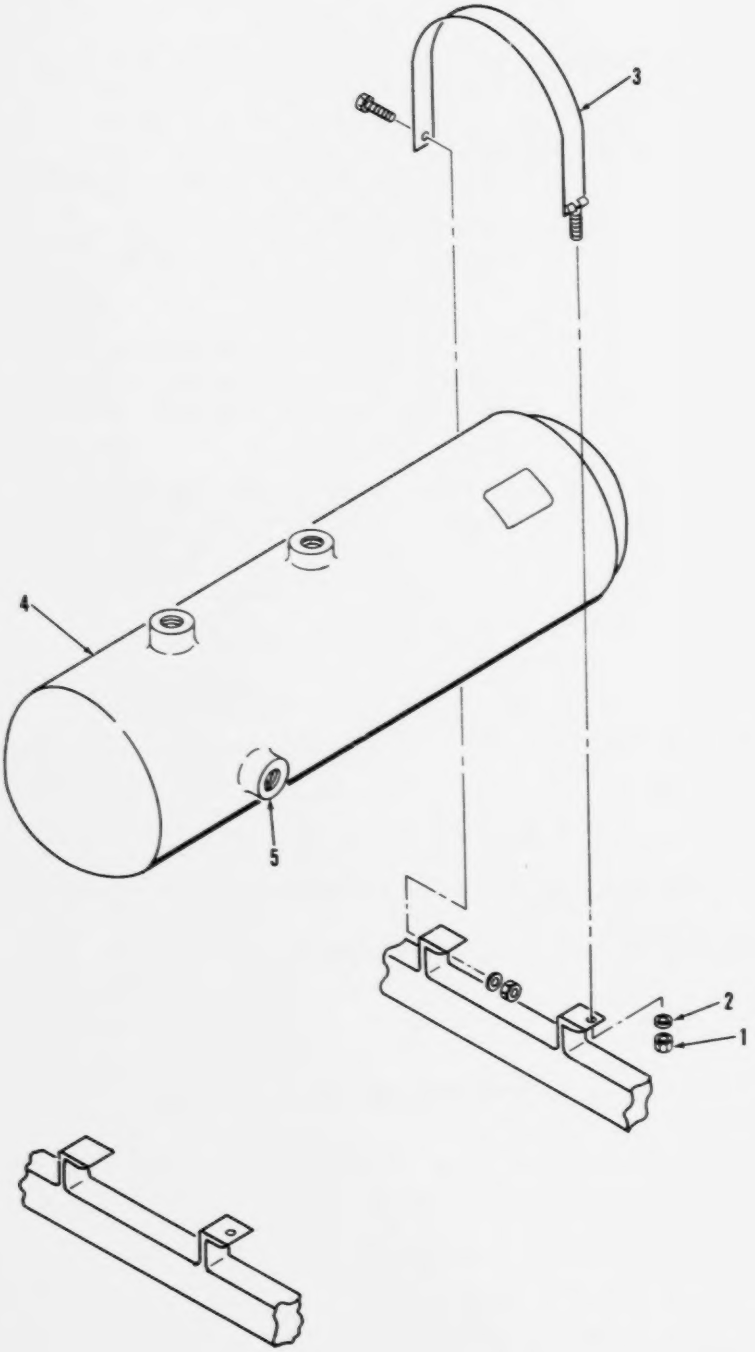
- Combustible - do not use near open flames, near welding areas, or on hot surfaces.
- Prolonged or repeated contact of skin with liquid can cause dermatitis. Repeated inhalation of vapor can irritate nose and throat and can cause dizziness.
- If any liquid contacts skin or eyes, immediately flush affected area thoroughly with water. Remove solvent-saturated clothing. If vapors cause dizziness, go to fresh air.
- When handling liquid or when applying it in an air-exhausted, partially covered tank, wear approved gloves.
- When handling liquid or when applying it at an unexhausted, uncovered tank or workbench, wear approved respirator, goggles, and gloves.

(3) Use brush, rag, and solvent as necessary to clean hand truck and straps.

(4) Place air tank (4) on handtruck with pilot valve boss (5) towards compressor and drain valve boss down.

(5) Secure air tank (4) with strap assemblies (3), two washers (2), and two nuts (1).

(6) Install all the hardware removed at the start of this procedure.



CHAPTER 5

INTERMEDIATE GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

SECTION I. TROUBLESHOOTING

5-1. TROUBLESHOOTING

a. Table 5-1 contains troubleshooting information for locating and correcting most of the operating troubles which are the responsibility of Intermediate General Support Maintenance. Each malfunction for an individual component, unit, or system is followed by a list of tests or inspections which will help you to determine probable causes and corrective actions to take. Perform the tests/inspections and corrective actions in the order listed.

b. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

c. Only those functions within the scope of general support maintenance are listed. For troubleshooting procedures within the scope of operator/crew maintenance, refer to table 3-1. For troubleshooting procedures within the scope of organizational maintenance, refer to table 4-3.

Table 5-1. Intermediate General Support Maintenance Troubleshooting

---

MALFUNCTION
    TEST OR INSPECTION
        CORRECTIVE ACTION

---

1. COMPRESSOR FAILS TO OPERATE.

    Step 1. With engine running and drive belts operating the compressor, air is not being pressurized.

        Replace compressor.

2. ENGINE FAILS TO OPERATE, OR OPERATES WITH EXCESSIVE NOISE.

    Step 1. Check for fuel in cylinder, compression in the cylinder, spark (strong and properly timed).

        Replace engine.

    Step 2. Check for excessive end play in the crankshaft.

        Replace engine.

Section II. Maintenance Procedures.

5-2. AIR COMPRESSOR OVERHAUL

This task covers:

a. Overhaul

Tools:
13-mm wrench
3/8-inch wrench
19-mm wrench
21-mm wrench
Gear Puller
Pliers, common
24-mm wrench
Pliers, Snap-Ring

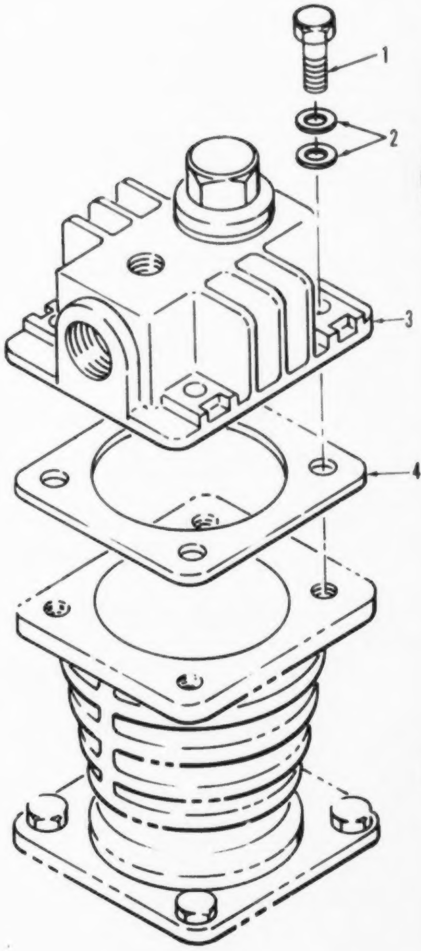
Material:
Rear Bearing Cover Packing
Front Bearing Cover Packing
Front Oil Seal
Oil Sight Gage Seal
Head Gasket (3 each)
First Stage Outlet Valve Packing (2 each)
Second Stage Outlet Valve Packing
Cylinder Gasket (3 each)
First Stage Compression Ring Set (2 each)
First Stage Oil Ring (2 each)
Second Stage Compression Ring Set
Second Stage Oil Ring
Brush, Cleaning (Appendix E, item 1)
Rag, Wiping (Appendix E, item 3)
Solvent, Dry cleaning (Appendix E, item 2).

Equipment Condition: Compressor removed from handtruck and placed on work bench (para 3-14). Tube assemblies removed (para 3-15).

a. Overhaul.

(1) Remove four bolts (1), and eight washers (2).

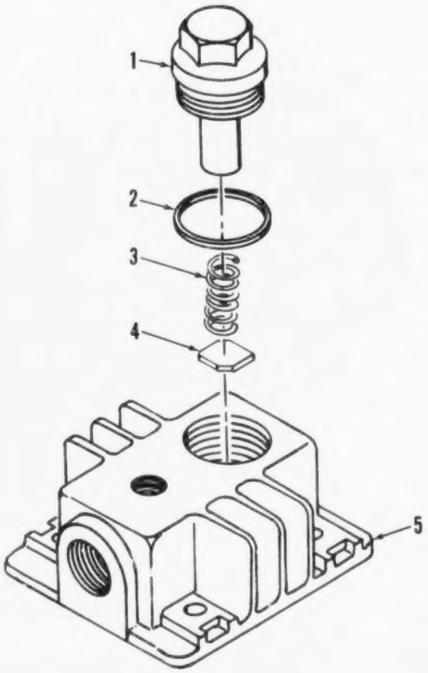
(2) Remove head (3) and gasket (4). Discard gasket.

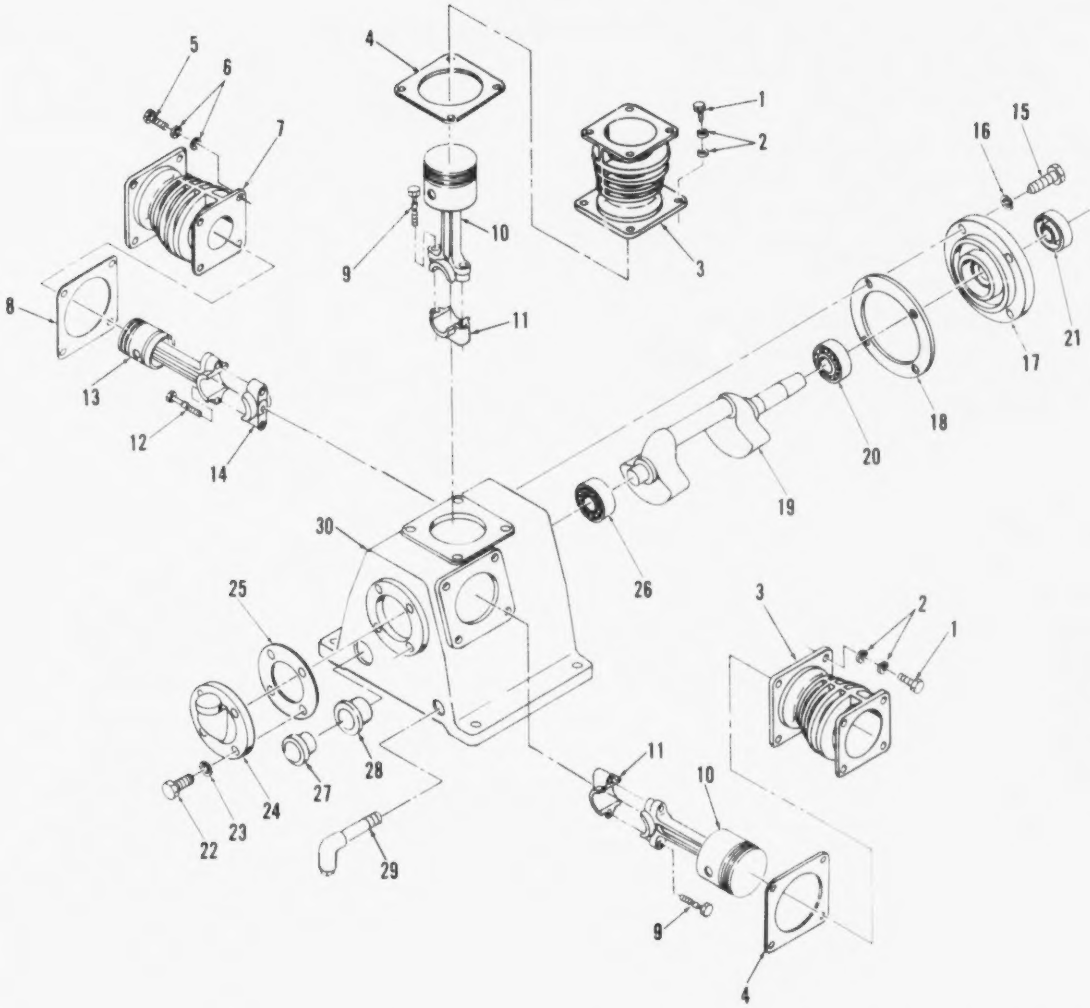


(3) Remove outlet valve push cover (1), packing (2), spring (3), and valve plate (4) from head (5). Discard packing (2).

(4) Remove four bolts (1), eight copper washers (2), first stage cylinder (3), and gasket (4). Discard gasket. Repeat for other first stage cylinder.

(5) Remove four bolts (5), eight copper washers (6), second stage cylinder (7), and gasket (8). Discard gasket.




5
4
6
7
1
2
16
15
10
9
3
8
11
21
17
13
12
18
14
20
19
30
25
26
3
2
1
11
10
28
27
24
23
22
29
9
4

(6) Remove two bolts (9), first stage connecting rod and piston assembly (10), and connecting rod cap (11). Repeat for other first stage piston.

(7) Remove two bolts (12), second stage connecting rod and piston assembly (13), and connecting rod cap (14).

(8) Remove four bolts (15), four washers (16), front bearing cover (17), and front beari gasket (18). Discard gasket.

(9) Remove crankshaft (19).

(10) Remove bearing (20) and bearing seal (21).

(11) Remove four bolts (22), four washers (23), rear bearing cover (24), and gasket (25). Discard gasket.

(12) Remove bearing (26).

(13) Remove oil sight gage (27) and oil sight gage seal (28).

(14) Remove oil drain plug (29) from crankcase (30).

(15) Remove all buildup of dirt, grease, etc., by wiping with a clean rag (Appendix E, item 3).

WARNING

Dry Cleaning Solvent
(Stoddard Solvent)
P-D-680

- Combustible - do not use near open flames, near welding areas, or on hot surfaces.
- Prolonged or repeated contact of skin with liquid can cause dermatitis. Repeated inhalation of vapor can irritate nose and throat and can cause dizziness.
- If any liquid contacts skin or eyes, immediately flush affected area thoroughly with water. Remove solvent-saturated clothing. If vapors cause dizziness, go to fresh air.
- When handling liquid or when applying it in an air-exhausted, partially covered tank, wear approved gloves.
- When handling liquid or when applying it at an unexhausted, uncovered tank or workbench, wear approved respirator, goggles, and gloves.

(16) Clean using a clean, soft cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1) and cleaning solvent (Appendix E, item 2).

(17) Inspect

(a) for missing or damaged hardware.

(b) cylinders for damage and wear.

(c) piston and connecting rod assembly for damage and wear.

(d) crankshaft for damage and wear.

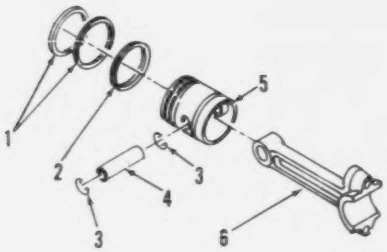
(e) crankcase for damage.

(f) front bearing cover for damage.

(g) rear bearing cover for damage.

(h) both bearings for damage and wear.

(18) Repair of the air compressor (except for the piston and connecting rod assemblies) is limited to the replacement of defective parts.



(19) Repair of the piston and connecting rod assemblies is as follows.

(a) Carefully remove both compression rings (1) and the oil ring (2). Discard the rings.

(b) Remove both snap rings (3) and using an arbor press, press out the piston pin (4).

(c) Separate the piston (5) from the connecting rod (6).

(d) Exchange defective parts for known good parts.

(e) Place piston (5) into position on connecting rod (6) and install piston pin (4) into position using an arbor press.

(f) Install two snap rings (3).

(g) Carefully install a new oil ring (2).

(h) Carefully install two new compression rings (1).

(20) Install oil drain plug (1) to crankcase (2).

(21) Install oil sight gage seal (3) and oil sight gage (4).

(22) Install bearing (5).

(23) Install new gasket (6), rear bearing cover (7), four copper washers (8), and four bolts (9).

(24) Install new bearing seal (10) and bearing (11).

(25) Install crankshaft (12).

(26) Install new gasket (13), front bearing cover (14), four washers (15), and four bolts (16).

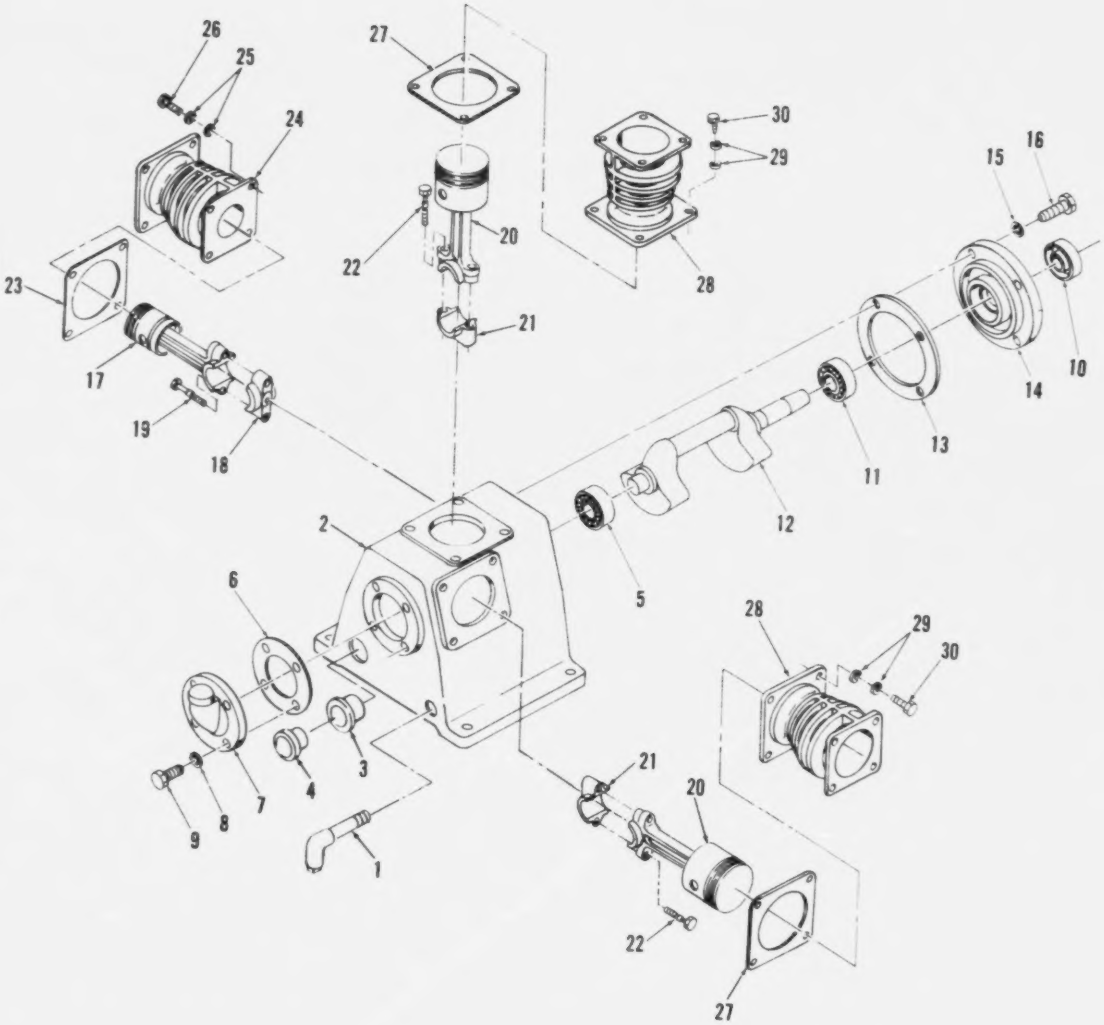
(27) Install second stage connecting rod and piston assembly (17), connecting rod cap (18), and secure with two bolts (19). Be sure that cap is installed in the original position.

(28) Install first stage connecting rod and piston assembly (20), connecting rod cap (21), and secure with two bolts (22). Be sure that cap is installed in the original position. Repeat for other first stage connecting rod and piston assembly.

(29) Install new gasket (23) into position.

(30) Carefully install cylinder (24) over connecting rod and piston assembly. Secure with eight copper washers (25) and four bolts (26). Repeat for the other first stage cylinder.

(31) Install gasket (27) into position.


26
25
24
27
30
29
16
15
23
22
20
21
28
10
14
17
19
18
13
11
12
2
5
6
28
29
30
21
20
3
4
7
8
9
1
22
27

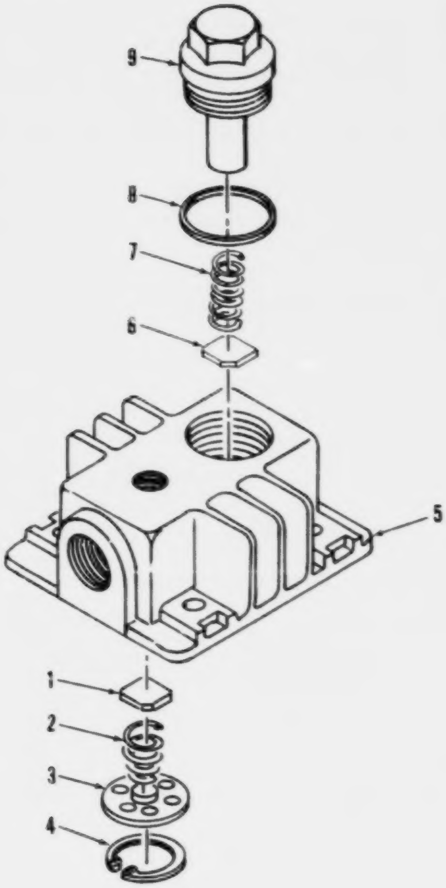
(32) Carefully install cylinder (28) over connecting rod and piston assembly. Secure with eight copper washers (29) and four bolts (30).

(33) Install flywheel.

(34) Install cylinder heads.

(35) Install valve plate (1), spring (2), valve receiver (3), and snap ring (4) to head (5).

(36) Install valve plate (6), spring (7), new packing (8), and push cover (9).



(37) Install new head gasket and head.

(38) Install eight washers and four bolts.

APPENDIX A

REFERENCES

A-1. SCOPE

This appendix lists all forms, field manuals, and technical manuals referenced in this manual.

A-2. FORMS

Recommended changes to publications and Blank Forms	DA 2028
Quality Deficiency Report	SF 368

A-3. TECHNICAL MANUALS

The Army Maintenance Management System (TAMMS)	DA PAM 738-750
Procedures for Destruction of Equipment to Prevent Enemy Use.	TM 750-244-3
Unit, Intermediate Direct Support and Intermediate General Support Maintenance Repair Parts and Special Tools List.	TM 5-4310-378-24P

APPENDIX B

MAINTENANCE ALLOCATION CHART

SECTION I. INTRODUCTION

B-1. GENERAL

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance categories.

b. The Maintenance Allocation Chart (MAC) in section II designates overall responsibility for the performance of maintenance functions on the identified end item or component. The implementation of the maintenance functions upon the end item or component will be consistent with the assigned maintenance functions.

c. Section III lists the special tools and test equipment required for each maintenance function as referenced from section II.

d. Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

B-2. MAINTENANCE FUNCTIONS

Maintenance functions will be limited to and defined as follows:

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination.

b. Test. To verify serviceability by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases.

d. Adjust. To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

e. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test, measuring, and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Install. The act of emplacing, seating, or fixing into position an item, part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. Replace. The act of substituting of a serviceable like type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

i. Repair. The application of maintenance services or other maintenance actions to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

j. Overhaul. That maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards in appropriate technical publications (i.e., DMWR). Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc.) considered in classifying Army equipments/components.

B-3. EXPLANATION OF COLUMNS IN THE MAC, SECTION II

a. Column 1. Group Number. Column 1 lists functional group code numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

b. Column 2. Component/Assembly. Column 2 contains the names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3. Maintenance Function. Column 3 lists the functions to be performed on the item listed in Column 2. (For detailed explanation of these functions, see paragraph B-2.)

d. Column 4. Maintenance Category. Column 4 specifies, by the listing of a work time figure in the appropriate subcolumn(s), the lowest level of maintenance authorized to perform the function listed in Column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate work time figure will be shown for each category. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance categories are as follows:

C	Operator or crew.
O	Organizational maintenance.
F	Direct support maintenance.
H	General support maintenance.
D	Depot maintenance.

e. Column 5. Tools and Equipment. Column 5 specifies by code those common tool sets (not individual tools) and special tools, TMDE, and support equipment required to perform the designated function.

f. Column 6. Remarks. This column shall, when applicable, contain a letter code, in alphabetic order, which shall be keyed to the remarks contained in Section IV.

B-4. EXPLANATION OF COLUMNS IN TOOL AND TEST EQUIPMENT REQUIREMENTS, SECTION III

a. Column 1. Reference Code. The tool and test equipment reference code correlates with a code used in the MAC, Section II, Column 5.

b. Column 2. Maintenance Category. The lowest category of maintenance authorized to use the tool or test equipment.

c. Column 3. Nomenclature. Name or identification of the tool or test equipment.

d. Column 4. National Stock Number. The National stock number of the tool or test equipment.

e. Column 5. Tool Number. The manufacturer's part number.

B-5. EXPLANATION OF COLUMNS IN REMARKS, SECTION IV

a. Column 1. Reference Code. The code recorded in column 6, Section II.

b. Column 2. Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC, Section II.

Section II. MAINTENANCE ALLOCATION CHART FOR COMPRESSOR UNIT, RECIPROCATING SCFM 175PSI, GASOLINE ENGINE DRIVEN, HAND TRUCK MOUNTED

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level Unit C	Unit O	Intermediate F	Intermediate H	Depot D	(5) Tools and Equipment	(6) Remarks
00	Compressor Unit, Reciprocating,								
01	COMPRESSOR DRIVE								
	Guard Assembly, Belt	Inspect	0.1						
		Replace		0.2				T1	
	Belts, V, Matched Set	Inspect		0.1				T1	
		Replace		0.2				T1	
	Pulley, Drive	Inspect		0.1				T1	
		Replace		0.2				T1, T4	
02	COMPRESSOR ASSEMBLY	Inspect	0.2						
		Replace		0.8				T1	
		Repair			1.0			T1, T2	
		Overhaul				4.0		T1, T3	
	Tube Assembly	Inspect		0.2				T1	
		Replace		0.3				T1	
	Interstage Relief Valve	Inspect		0.1				T1	
		Replace		0.2				T1	
	Air Cleaner	Inspect	0.1						
		Replace		0.2				T1	
	Oil Filler Cap and Sight Glass	Inspect	0.1						
		Replace		0.2				T1	
	Flywheel	Inspect		0.2				T1	
		Replace		0.3				T1, T4	
	Unloader Valves	Inspect		0.1				T1	
		Replace		0.2				T1, T4	
	Cylinder Head, Intake and Exhaust Valves	Inspect			0.2			T1, T4	
		Replace			0.3			T1, T4	
		Repair			0.6			T1, T4	

Section II. MAINTENANCE ALLOCATION CHART FOR COMPRESSOR UNIT, RECIPROCATING SCFM 175PSI, GASOLINE ENGINE DRIVEN, HAND TRUCK MOUNTED

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Unit		Intermediate		Depot		
			C	O	F	H	D		
	Pistons, Connecting Rods and Cylinder Block	Inspect			0.3			T1, T2	
		Replace			0.5			T1,T2	
		Repair			5.0			T1,T2	
	Crankshaft, Bearings, Oil Seals and Crankcase	Inspect			0.4			T1,T2	
		Replace			0.6			T1,T2	
		Repair			2.5			T1,T2	
03	ENGINE ASSEMBLY	Inspect	0.2						
		Replace		0.8				T1	
		Repair			1.0			T1,T2	
	Fuel Tank Assembly and Fuel Filter	Inspect	0.1						
		Service	0.3						
		Replace		0.4				T1,T4	
	COOLING SYSTEM								
	Ducts, Covers, Baffles	Inspect	0.1						
		Replace		1.3				T1,T4	
	Flywheel	Inspect		0.2				T1	
		Replace		0.3				T1,T4	
	IGNITION COMPONENTS								
	Coil	Inspect		0.1				T1	
		Test		0.3				T1,T4	
		Replace		0.2				T1,T4	
	Switch, Ignition (Stop Button)	Inspect		0.1				T1	
		Test		0.3				T1,T4	
		Replace		0.2				T1,T4	
	Spark Plug	Inspect		0.1				T1	
		Service		0.2				T1,T4	
		Replace		0.2				T1,T4	

Section II. MAINTENANCE ALLOCATION CHART FOR COMPRESSOR UNIT, RECIPROCATING SCFM 175PSI, GASOLINE ENGINE DRIVEN, HAND TRUCK MOUNTED

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level Unit		Intermediate		Depot	(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
	AIR CLEANER ASSEMBLY	Inspect	0.1						
		Service	0.3						
		Replace		0.7					
	Element	Inspect	0.1						
		Service	0.2					T1	
		Replace		0.3				T1, T4	
	CARBURETOR								
	Carburetor	Inspect		0.1				T1, T4	
		Service		0.1				T1, T4	
		Adjust		0.1				T1, T4	
		Replace		0.4				T1, T4	
	ENGINE SPEED GOVERNOR AND CONTROLS								
	Governor	Inspect		0.1					
		Adjust		0.3				T1, T4	
		Replace			0.9			T1, T2	
	Governor Rod Assembly	Inspect		0.1				T1	
		Adjust		0.2				T1, T4	
		Replace			0.5			T1, T2	
	Governor Control Assembly	Inspect		0.1				T1	
		Adjust		0.2				T1, T4	
		Replace		0.4				T1, T2	
	Recoil Starter Assembly	Inspect	0.1						
		Replace		0.3				T1, T4	
		Repair		0.9				T1, T4	
	Cylinder Head and Gasket	Inspect		0.1				T1	
		Service		0.3				T1, T4	
	Oil Dipstick and Gasket	Inspect	0.1						
		Replace		0.2				T1, T4	

Section II. MAINTENANCE ALLOCATION CHART FOR COMPRESSOR UNIT, RECIPROCATING SCFM 175PSI, GASOLINE ENGINE DRIVEN, HAND TRUCK MOUNTED

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Unit		Intermediate		Depot		
			C	O	F	H	D		
04	AIR RECEIVER SYSTEM								
	Aftercooler Assembly	Inspect		0.1					
		Replace		0.3				T1, T4	
	Safety Valve	Inspect		0.1				T1	
		Replace		0.2				T1, T4	
	Drain Valve	Inspect	0.1						
		Replace		0.2				T1, T4	
	Pressure Gauge	Inspect		0.1				T1	
		Replace		0.1				T1, T4	
	Tank Relief Valve	Inspect	0.1						
		Replace		0.2				T1, T4	
	Air Tank	Inspect		0.1				T1	
		Replace			0.5			T1, T2	
05	AIR DISCHARGE SYSTEM								
	Hoses	Inspect	0.1						
		Replace		0.2				T1, T4	
	Inflator Gauge	Inspect	0.1						
		Replace		0.2				T1, T4	
06	HANDTRUCK ASSEMBLY								
	Wheels	Inspect		0.2				T1	
		Replace		0.3				T1, T4	
	Tires and Tubes	Inspect		0.1				T1	
		Service		0.1				T1, T4	
		Repair		0.2				T1, T4	
		Replace		0.4				T1, T4	

SECTION III. TOOL AND TEST EQUIPMENT REQUIREMENTS FOR COMPRESSOR UNIT, RECIPROCATING SCFM 175PSI, GASOLINE ENGINE DRIVEN, HAND TRUCK MOUNTED

(1) Reference Code	(2) Maintenance Level	(3) Nomenclature	(4) National/NATO Stock Number	(5) Tool Number
T1	C,O,F,H	Tool Kit, General Mechanic, Automotive	5180-00-177-7033	
T2	F	Shop Set, Automotive Repair, Field Maintenance, Basic	4910-00-754-0705	
T3	H	Shop Set, Machine: Field Maintenance, Heavy	3470-00-754-0738	
T4	O	Shop Equipment Automotive Maintenance and Repair: Organization, Common NO1	4910-754-0654	
	C,O,F,H	Tool Kit, General Mechanic, Automotive, Metric	5180-01-100-0963	
	O	Tool Kit, Organization Maintenance, Metric	5180-01-100-0964	
	F	Tool Kit, Direct Support Maintenance, Metric	5180-01-100-0965	

SECTION IV. REMARKS

Reference Code	Remarks

APPENDIX C

COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LISTS

SECTION I. INTRODUCTION

C-1. SCOPE

This appendix lists components of end item and basic issue items for the air compressor to help you inventory items required for safe and efficient operation.

C-2. GENERAL

The Components of End Item and Basic Issue Items Lists are divided into the following sections:

a. Section II. Components of End Item. This listing is for informational purposes only, and is not authority to requisition replacements. These items are part of the end item, but are removed and separately packaged for transportation or shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Illustrations are furnished to assist you in identifying the items.

b. Section III. Basic Issue Items. These are the minimum essential items required to place the air compressor in operation, to operate it, and to perform emergency repairs. Although shipped separately packaged, BII must be with the air compressor during operation and whenever it is transferred between property accounts. The illustrations will assist you with hard-to-identify items. This manual is your authority to request/requisition replacement BII, based on TOE/MTOE authorization of the end item.

C-3. EXPLANATION OF COLUMNS

The following provides an explanation of columns found in the tabular listings:

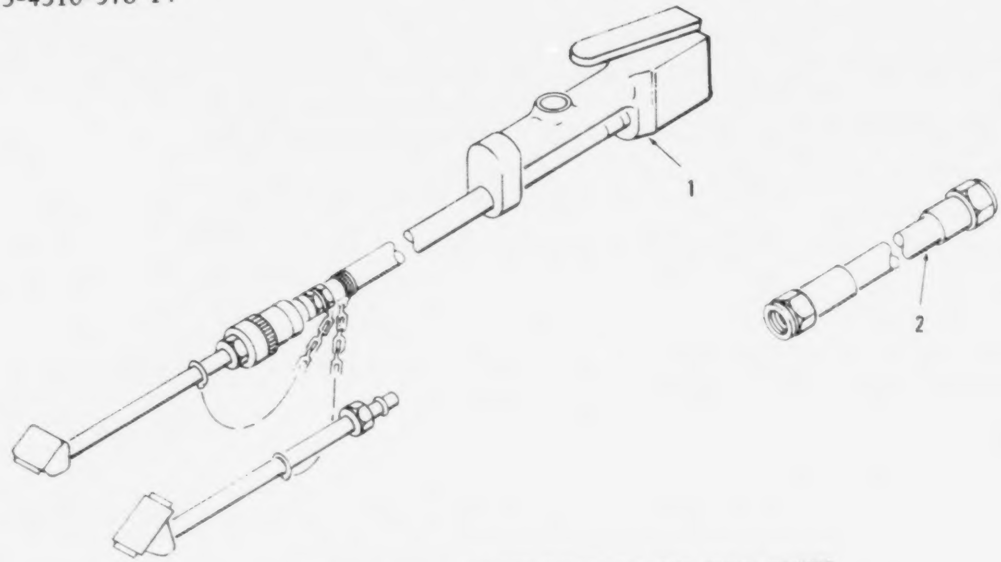
a. Column (1) - Illustration Number (Illus Number). This column indicates the number of the illustration in which the item is shown.

b. Column (2) - National Stock Number. Indicates the National stock number assigned to the item and will be used for requisitioning purposes.

c. Column (3) - Description. Indicates the Federal item name and, if required, a minimum description to identify and locate the item. The last line for each item indicates the FSCM (in parentheses) followed by the part number.

d. Column (4) - Unit of Measure (U/M). Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr).

e. Column (5) - Quantity required (Qty rqr). Indicates the quantity of the item authorized to be used with/on the equipment.



SECTION II. COMPONENTS OF END ITEM

(1) Illus Number	(2) National Stock number	(3) Description FSCM and Part number	(4) U/M	(5) Qty rqr
1		INFLATOR GAGE (94894) 61-J2-1506	EA	1
2		HOSE ASSEMBLY, DELIVERY (65473) GYAC5-PFS4-PFS4-600	EA	1

SECTION III. BASIC ISSUE ITEMS

(1) Illus Number	(2) National Stock number	(3) Description FSCM and Part number	(4) U/M	(5) Qty rqr

APPENDIX D

ADDITIONAL AUTHORIZATION LIST

SECTION I. INTRODUCTION

D-1. SCOPE

This appendix lists additional items you are authorized for the support of the air compressor.

D-2. GENERAL

This list identifies items that do not have to accompany the air compressor and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TDA, or JTA.

D-3. EXPLANATION OF LISTING

National stock numbers, descriptions, and quantities are provided to help you identify and request the additional items you require to support this equipment. The items are listed in alphabetical sequence by item name under the type document (i.e., CTA, MTOE, TDA, or JTA) which authorizes the item(s) to you.

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION FSCM & PART NUMBER USABLE ON CODE	(3) U/M	(4) QTY AUTH
	BINDER, LOG BOOK	EA	1
	PROTECTOR, EAR	PR	1

APPENDIX E

EXPENDABLE SUPPLIES AND MATERIALS LIST

SECTION I. INTRODUCTION

E-1. SCOPE This appendix lists expendable supplies and materials required to operate and maintain the air compressor. These items are authorized by CTA 50-970, Expendable Items (Except Medical Class V, Repair Parts and Heraldic Items).

E-2. EXPLANATION OF COLUMNS

a. Column I - Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions of this manual to identify the material (e.g., "Use dry cleaning solvent, item I, App E").

b. Column 2 - Level. This column identifies the lowest level of maintenance authorized to use the item listed.

C .... Operator/Crew

c. Column 3 - National Stock Number. This column identifies the National Stock Number assigned to the item. The National Stock Number should be used to request or requisition the item.

d. Column 4 - Description. This column indicates the Federal item name and, if required, a description of the item. The last line indicates the Federal Supply Code for Manufacturer (FSCM) in parentheses followed by the part number.

e. Column 5 - Unit of Measure (U/M). This column indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in., pr). If the unit of measure differs from the unit of issue, request or requisition the lowest unit of issue that will satisfy the requirement.

SECTION II. EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) Item No.	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
1	C	7920	BRUSH, Cleaning, tools and parts	EA
2	C		SOLVENT, Dry cleaning SD (81348) P-D-680, type II	
		6850-00-664-5685 6850-00-281-1985	1-qt can 1-gal can	QT GL
3	C	7920-00-205-1711	RAG, Wiping, cotton, white, bleached, 50 lb bale (81348) DD-R-30	LB
4	C		GREASE, Automotive and artillery MIL-G-10924	LB
5	C		LUBRICATING OIL, Internal combustion engine, heavy duty, MIL-L-2104, grade 10 or grade 30	QT
6	C		PRESERVING OIL, Engine, MIL-L-21260P-10	QT
7	C		LUBRICATING OIL, Arctic conditions MIL-L-46167	QT
8	C		KEROSENE, VV-K-211	QT
9	C		LEAK TECK	EA

GLOSSARY

SECTION I. ABBREVIATIONS

°C	Degree Celsius
CBR	Chemical-biological-radiological
°F	Degree Fahrenheit
ft lb	Foot pound
gpm	Gallons per minute
kg	kilogram
kPa	Kilopascal
mm	Millimeter
N·m	Newton meter
NPT	National pipe thread
phr	Pounds per hour

SECTION II. DEFINITION OF UNUSUAL TERMS

A

ABRASION - A scraped or scuffed area. A hose may become abraded if an unshielded portion of it rubs against a piece of bracket or another hose.

ALIGN - To arrange in a line vertically and/or horizontally.

ALPHA-NUMERIC - In alphabetical and numerical order. An alpha-numeric die set includes one die for each letter in the alphabet, and one die for each number zero through nine.

ASSEMBLY - A combination of parts that may be taken apart without destruction, which has no application or use of its own but is needed for the completeness of a more complex item with which it is combined, or to which it is attached.

B

BAIL - An arched, hooplike handle, as of a pail.

BRINELLED - A deformation of a bearing by impact.

C

CARBON MONOXIDE - A poisonous gas that is made while a fuel is burning, especially if there is not quite enough air. The gas is colorless, odorless, and tasteless, but it can cause illness or death. See warning on the Warning page at front of manual.

CONDENSATION - A liquid formed from a vapor. Moisture carried in warm air will condense when it reaches a cold area, such as the surface of a fuel tank in sub-zero weather.

CONTAMINATED - Made impure by contact or mixture. Exhaust fumes contain a poisonous gas which will contaminate the air in the nearby area.

CORROSION - A gradual wearing away caused by chemical action. Metals exposed to salt water are likely to corrode.

D

DETERIORATE - A worsening of condition usually as a result or age or hostile environment, as opposed to mechanical damage.

DIAPHRAGM - An elastic material used as a boundary to seal and separate two areas. A pump diaphragm allows the volume of the pump bowl to be varied thus producing the pumping action.

DRAW BAR - A single piece handle used for lifting heavy objects.

DRY ROT - Rotting due to lack or air circulating around area.

E

EXPENDABLE - An item that is not repairable and is discarded if damaged.

EXPOSURE - Being in the presence of something, or in contact with something. Skin is exposed to cleaning solvent when the solvent contacts the skin during cleaning operations.

F

FILTER - A device which removes dirt from air or a fluid.

FLASH POINT - The lowest temperature at which the vapors of a solvent will ignite and burn.

FLAPPER - A restriction in a line which limits the flow of fluid, or gases, to a single direction. Flappers used in conjunction with a diaphragm pump and power source enable the pump to push/pull fluid in desired direction.

G

GALLING - A condition in which transfer of metal occurs between two parts made of like material (usually steel), usually occurring when mated parts have limited relative motion under high loads.

I

IMMERSE - To completely cover by fluid.

INHALATION - The act or breathing in. The breathing in or inhalation of carbon monoxide can cause illness or death. Refer to the Warning page at front of manual.

INITIAL - The first or starting condition.

INNER RACE - A component of a bearing assembly upon which the needles or rollers ride; used to insure full contact and uniform surface condition.

K

KEYWAY - A channel machined in a shaft into which a length or hardened steel stock, usually rectangular in cross section, is inserted to prevent the relative motion of a mating part.

L

LUBRICANT - A material such as grease, or machine oil, that reduces friction, and preserves, when used as a coating on moving parts.

M

MALFUNCTION - Occurs when a unit fails to operate normally.

MATERIEL - Equipment, apparatus, and supplies of an organization such as an army.

O

OBSTRUCTION - An obstacle.

OPERATIONAL - Available for use in accordance with the applicable specification.

OUTPUT - The energy, power, or work produced by a system.

P

PIVOT - A short rod or shaft about which a related part rotates; the act of turning on or as if on a pivot.

PORT - A threaded hole through which fluid may pass, or pressure may be measured. Ports on the pump are used to connect hoses, and to measure pressure.

PRIME - The act of introducing a liquid into a pump to increase the pump's ability to overcome negative head pressure.

PROTRUDING - Pushing or jutting outward; projecting.

PROVISIONS - Stipulations or qualifications. Also that which is provided; stock of necessary supplies.

R

RADIOLOGICAL - Using ionizing radiation, or radioactive waves or particles. Radiological protection shields the person or object from damage or injury due to harmful radiation.

RANGE - The minimum and maximum performance levels or any unit and including all measurable points between them.

RECIPROCATING - Equipment that acts along a straight line in alternating direction, i.e., the up and down motion of the connecting rod.

RESTRICTED - Limited, confined; prevented from moving. Also the reduction of cross-sectional area through which a gas or liquid must flow.

S

SCOPE - The extent of a activity or concept; the amount or information covered as in a book.

SHOCK - An extreme stimulation of the nerves and muscles caused by the passage of electric current through the body. Also damage caused to mechanical equipment as result of sudden stoppage of motion.

SLINGING - Using a looped or hanging strap to raise and lower a heavy object, or for carrying or supporting something.

STREET ELBOW - A 90-degree pipe elbow which has male threads on one end and female threads on the other.

STUD - A type of fastener, or alignment device, which has one end attached to a surface and the other end protruding from that surface. The protruding portion of the stud may be used as an alignment aid or, if threaded, as a fastener.

T

TIEDOWN - Strap or fastening device used to hold an object in position.

TORQUE - Force around an axis. It produces a rotary or twisting motion, and is measured by foot pounds (ft lb) or newton-meters (N·m).

V

VALVE - A device used to control the flow of a fluid.

VAPOR - The gaseous form of any substance which is usually a liquid; vapors are present in the air around the substance.

W

WARPAGE - The twisting, bending, or other distortion of an object which alters its shape.

ALPHABETICAL INDEX

Subject, Para

A

Adjustments, Initial, 2-6
Administrative Storage, 3-48
Aftercooler Assembly, 3-37
Air Cleaner Element, 3-29
Air Cleaner, Compressor, 3-17
Air Cleaner, Engine, 3-28
Air Compressor, 1-14
Air Compressor Overhaul, 5-2
Air Compressor Unit Function, 1-13
Air Compressor Unit, Purpose of, 1-7
Air Discharge Hose, 3-43
Air Tank, 4-9
Air Tank, 3-42
Altitudes, Operation in High, 2-15
Areas, Operation in Sandy or Dusty, 2-16
Assembly and Preparation for Use, 2-5

B

Bearing Lubrication Procedure, Wheel, 3-4
Bearings, Oil Seals, and Crankcase, Compressor Crankshaft, 4-6
Belt Guard Assembly, 3-11
Belts, Matched Set V -, 3-12

C

Cap and Sight Glass, Oil Filler, 3-18
Capabilities and Features, 1-8
Carburetor, 3-30
Cleaner Element, Air, 3-29
Cleaner, Compressor Air, 3-17
Cleaner, Engine Air, 3-28
Coil, Engine Ignition, 3-25
Cold, Operation in Extreme, 2-13
Common Tools and Equipment, 3-5
Compressor Air Cleaner, 3-17
Compressor Assembly, 3-14
Compressor Assembly, 4-3
Compressor Crankshaft, Bearings, Oil Seals, and Crankcase, 4-6
Compressor Cylinder Heads and Valves, 4-4
Compressor Flywheel, 3-19
Compressor Lubrication Procedure, 3-2
Compressor Overhaul, Air, 5-2
Compressor Crankshaft Bearings, Oil Seals, and Crankcase, 4-6

Subject, Para

Compressor Pistons, Connecting Rods, and Cylinders, 4-5
Compressor, Air, 1-14
Connecting Rods, and Cylinders, Compressor Pistons, 4-5
Control Assembly, Engine Governor and, 4-8
Control Assembly, Governor, 3-33
Covers, and Deflectors, Ducts, 3-23
Crankcase, Compressor Crankshaft, Bearings, Oil Seals, and, 4-6
Crankshaft, Bearings, Oil Seals, and Crankcase, Compressor, 4-6
Cylinder Head and Gasket, 3-35
Cylinder Heads and Valves, Compressor, 4-4
Cylinders, Compressor Pistons, Connecting Rods, and, 4-5

D

Deflectors, Ducts, Covers, and, 3-23
Destruction of Army Materiel to Prevent Enemy Use, 1-3
Dipstick and Gasket, Oil, 3-36
Discharge Hose, Air, 3-43
Drain Valve, 3-39
Drive Pulley, 3-13
Ducts, Covers, and Deflectors, 3-23
Dusty Areas, Operation in Sandy or, 2-16

E

Element, Air Cleaner, 3-29
Engine Air Cleaner, 3-28
Engine Assembly, 3-21
Engine Assembly, 4-7
Engine Governor and Control Assembly, 4-8
Engine Ignition Coil, 3-25
Engine Lubrication Procedure, 3-3
Equipment Data, 1-11
Equipment Improvement Recommendations (EIR), Reporting, 1-5
Equipment, Common Tools and, 3-5
Equipment, Special Tools, TMDE, and Support, 3-6
External Components, Location and Description of, 1-9
Extreme Cold, Operation in, 2-13
Extreme Head, Operation in, 2-14

Subject, Para

F

Features, Capabilities and, 1-8
Filler Cap and Sight Glass, Oil, 3-18
Filter Assemblies, Fuel Tank and Fuel, 3-22
Flywheel, 3-24
Flywheel, Compressor, 3-19
Fuel Filter Assemblies, Fuel Tank and, 3-22
Fuel Tank and Fuel Filter Assemblies, 3-22

G

Gage, Inflator, 3-44
Gage, Pressure, 3-40
Gasket, Cylinder Head and, 3-35
Gasket, Oil Dipstick and, 3-36
Glass, Oil Filler Cap and Sight, 3-18
Governor, 3-31
Governor Control Assembly, 3-33
Governor Rod Assembly, 3-32
Governor and Control Assembly, Engine, 4-8
Guard Assembly, Belt, 3-11

H

Heads and Valves, Compressor Cylinder, 4-4
Heat, Operation in Extreme, 2-14
High Altitudes, Operation in, 2-15
Hose, Air Discharge, 3-43
Humid Conditions, Operation Under Rainy or, 2-17

I

Identification, 1-10
Ignition Coil, Engine, 3-25
Ignition Switch, 3-26
Inflator Gage, 3-44
Initial Adjustments, 2-6
Interstage Relief Valve, 3-16

L

Location and Description of External Component, 1-9
Lubrication Methods, 3-1
Lubrication Procedure, Compressor, 3-2
Lubrication Procedure, Engine, 3-3

Subject, Para

Lubrication Procedure, Wheel Bearing, 3-4

M

Maintenance Forms, Records, and Reports, 1-2
Matched Set V—Belts, 3-12
Movement to a New Worksite, 2-12
Movement, Preparation for, 2-11

N

New Worksite, Movement to a, 2-12

O

Oil Dipstick and Gasket, 3-36
Oil Filler Cap and Sight Glass, 3-18
Oil Seals, and Crankcase, Compressor Crankshaft, 4-6
Operating Procedure, 2-7
Operation, 2-9
Operation Under Rainy or Humid Conditions, 2-17
Operation at High Altitudes, 2-15
Operation in Extreme Cold, 2-13
Operation in Extreme Heat, 2-14
Operation in Salt Water Areas, 2-18
Operation in Sandy or Dusty Areas, 2-16
Overhaul, Air Compressor, 5-2

P

Packing and Shipping, 3-49
Parts, Repair, 3-7
Pilot Valve, Safety, 3-38
Pistons, Connecting Rods, and Cylinders, Compressor, 4-5
Plug, Spark, 3-27
Preparation for Movement, 2-11
Preparation for Storage and Shipment, 1-4
Preparation for Use, Assembly and, 2-5
Preventive Maintenance Checks and Services (PMCS), Operator, 2-2
Preventive Maintenance Checks and Services (PMCS), Unit, 3-8
Pressure Gage, 3-40
Prevent Enemy Use, Destruction of Army Materiel to, 1-3

Subject, Para

Procedure, Compressor Lubrication, 3-2
Procedure, Engine Lubrication, 3-3
Procedure, Wheel Bearing Lubrication, 3-4
Pulley, Drive, 3-13
Purpose of Air Compressor Unit, 1-7

R

Rainy or Humid Conditions, Operation Under, 2-17
Recoil Starter Assembly, 3-34
Records and Reports, Maintenance Forms, 1-2
Relief Valve, Interstage, 3-16
Relief Valve, Tank, 3-41
Repair Parts, 3-7
Reporting Equipment Improvement Recommendations (EIR), 1-5
Rod Assembly, Governor, 3-32

S

Safety Pilot Valve, 3-38
Salt Water Areas, Operation in, 2-18
Sandy or Dusty Areas, Operation in, 2-16
Scope, 1-1
Section Overview, 1-12
Shipping, Packing and, 3-49
Sight Glass, Oil Filler Cap and, 3-18
Spark Plug, 3-27
Special Tools, TMDE, and Support Equipment, 3-6
Starter Assembly, Recoil, 3-34
Starting, 2-8
Stopping, 2-10
Storage and Shipment, Preparation for, 1-4
Storage, Administrative, 3-48
Support Equipment, Special Tools, TMDE, and, 3-6
Switch, Ignition, 3-26

Subject, Para

T

TMDE, and Support Equipment, Special Tools, 3-6
Tank Relief Valve, 3-41
Tank and Fuel Filter Assemblies, Fuel, 3-22
Tank, Air, 3-42
Tank, Air, 4-9
Tires and Tubes, 3-46
Tools and Equipment, Common, 3-5
Tools, TMDE, and Support Equipment, Special, 3-6
Troubleshooting, 5-1
Tube Assemblies, 3-15
Tubes, Tires and, 3-46

U

Unit Function, Air Compressor, 1-13
Unloader Valve Assemblies, 3-20
Use, Assembly and Preparation for, 2-5

V

V-Belts, Matched Set, 3-12
Valve Assemblies, Unloader, 3-20
Valve, Drain, 3-39
Valve, Interstage Relief, 3-16
Valve, Safety Pilot, 3-38
Valve, Tank Relief, 3-41
Valves, Compressor Cylinder Heads and, 4-4

W

Warranty Information, 1-6
Wheel Bearing Lubrication Procedure, 3-4
Wheels, 3-45
Worksite, Movement to a New, 2-12

By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-25A, Operator, Organizational, Direct Support and General Support Maintenance requirements for Compressor, Reciprocating, Air, Gas, Hand Truck Mounted, 5 CFM, 175 PSI (20-902/3).

☆U.S.GOVERNMENT PRINTING OFFICE:1989-242-466/08279

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

THEN... JOT DOWN THE DOPE ABOUT IT ON THIS FORM, CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

SOMETHING WRONG WITH THIS PUBLICATION?

FROM (PRINT YOUR UNIT'S COMPLETE ADDRESS)

PFC JOHN DOE
COA, 3d ENGINEER BN
FT. LEONARDWOOD, MO 63108

DATE SENT

PUBLICATION NUMBER TM 5-4310-378-13	PUBLICATION DATE 1 July 1986	PUBLICATION TITLE Compressor Unit 5 CFM, 175PSI, NSN 4310-01-190-0285

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO	IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
6	2-1 a			In line 6 of paragraph 2-1a the manual states the engine has 6 Cylinders. The engine on my set only has 4 Cylinders. Change the manual to show 4 Cylinders.
B1		4-3		Callout 16 on figure 4-3 is pointing at a bolt. In key to figure 4-3, item 16 is called a shim - Please correct one or the other.
125	line		20	I ordered a gasket, item 19 on figure B-16 by NSN 2910-00-762-3001. I got a gasket bit it doesn't fit. Supply says I got what I ordered, so the NSN is wrong. Please give me a good NSN

PRINTED NAME, GRADE OR TITLE AND TELEPHONE NUMBER
JOHN DOE, PFC (268) 317-7111

SIGN HERE John DOE
JOHN DOE

DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE.

DRSTS-M Overprint 1, 1 Nov 80

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS

TEAR ALONG PERFORATED LINE

REVERSE OF DA FORM 2028-2 Reverse of DRSTS-M Overprint 2,
1 Nov 80

FILL IN YOUR
UNIT'S ADDRESS

FOLD BACK

TEAR ALONG PERFORATED LINE

DEPARTMENT OF THE ARMY

____

____

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

COMMANDER
U S ARMY TROOP SUPPORT COMMAND
ATTN: AMSTR-MCTS
4300 GOODFELLOW BOULEVARD
ST. LOUIS, MO 63120-1798

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

THEN. . JOT DOWN THE DOPE ABOUT IT ON THIS FORM, CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER TM 5-4310-378-13	PUBLICATION DATE 1 July 1986	PUBLICATION TITLE Compressor Unit, 5 CFM, 175PSI, NSN 4310-01-190-0285

BE EXACT. PIN-POINT WHERE IT IS				IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO	

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

SIGN HERE

DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE.

DRSTS-M Overprint 2, 1 Nov 80.

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

TEAR ALONG PERFORATED LINE

REVERSE OF DA FORM 2028-2 Reverse of DRSTS-M Overprint 2,
1 Nov 80

TEAR ALONG PERFORATED LINE

FILL IN YOUR
UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

____

____

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

COMMANDER
U S ARMY TROOP SUPPORT COMMAND
ATTN: AMSTR-MCTS
4300 GOODFELLOW BOULEVARD
ST. LOUIS, MO 63120-1798

TEAR ALONG PERFORATED LINE

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

SOMETHING WRONG WITH THIS PUBLICATION?

THEN. . JOT DOWN THE DOPE ABOUT IT ON THIS FORM. CAREFULLY TEAR IT OUT. FOLD IT AND DROP IT IN THE MAIL!

FROM (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 5-4310-378-13	1 July 1986	Compressor Unit, 5 CFM, 175PSI, NSN 4310-01-190-0285

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARAGRAPH	FIGURE NO	TABLE NO

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

SIGN HERE

DA FORM 1 JUL 79 **2028-2**

PREVIOUS EDITIONS ARE OBSOLETE.

DRSTS-M Overprint 2, 1 Nov 80.

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS

REVERSE OF DA FORM 2028-2 Reverse of DRSTS-M Overprint 2,
1 Nov 80

TEAR ALONG PERFORATED LINE

FILL IN YOUR
UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

____

____

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

COMMANDER
U S ARMY TROOP SUPPORT COMMAND
ATTN: AMSTR-MCTS
4300 GOODFELLOW BOULEVARD
ST. LOUIS, MO 63120-1798

TEAR ALONG PERFORATED LINE

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

SOMETHING WRONG WITH THIS PUBLICATION?

THEN. . JOT DOWN THE DOPE ABOUT IT ON THIS FORM, CAREFULLY TEAR IT OUT. FOLD IT AND DROP IT IN THE MAIL!

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER TM 5-4310-378-13	PUBLICATION DATE 1 July 1986	PUBLICATION TITLE Compressor Unit, 5 CFM, 175PSI, NSN 4310-01-190-0285

BE EXACT. PIN-POINT WHERE IT IS				
PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO	IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER	SIGN HERE

DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE.

DRSTS-M Overprint 2, 1 Nov 80.

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS

REVERSE OF DA FORM 2028-2 Reverse of DRSTS-M Overprint 2,
1 Nov 80

FILL IN YOUR
UNIT'S ADDRESS

FOLD BACK

TEAR ALONG PERFORATED LINE

DEPARTMENT OF THE ARMY

____

____

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

COMMANDER
U S ARMY TROOP SUPPORT COMMAND
ATTN: AMSTR-MCTS
4300 GOODFELLOW BOULEVARD
ST. LOUIS, MO 63120-1798

The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton-meters	.11296			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C